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SEVERE FEBRILE IODISM DURING THE TREATMENT OF HYPERTHYROIDISM

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BALTIMORE

Iodine has been used in the treatment of exophthalmic goiter for more than a hundred years. It was not until 1923, however, that Plummer¹ first presented convincing evidence of the value of medication with iodine as an adjunct to surgery in the treatment of hyperthyroid patients. Today the administration of iodine in the form of compound solution of iodine (Lugol's solution) or potassium iodide is employed in a routine manner as a preoperative measure by the majority of physicians and surgeons both in this country and abroad. Properly used, iodine appears to effect striking clinical improvement, as manifested by a diminution of the nervous symptoms, a fall in the basal metabolic rate, a decrease in pulse rate and frequently an appreciable gain in weight. As a result of the alleviation of many of the signs and symptoms of the disease the patient is better prepared to withstand the shock of a major surgical procedure, and the danger of a serious postoperative "thyroid crisis" is materially reduced.

In view of the widespread use of iodine in the treatment of hyperthyroidism it is surprising how few unfavorable reactions to this form of therapy have been reported. A small proportion of patients appear to be iodine resistant in that they fail to respond to the administration of iodine in the usual manner. Lerman² found the mortality to be higher in the iodine-resistant cases than in the responding cases, but he felt that other factors such as advanced age and cardiac disease were equally important in raising the mortality rate of this group. There was no evidence to suggest that the iodine per se had exerted any deleterious action likely to increase the operative risk in these cases. Aside from iodine resistance, which may more properly be termed an indifferent reaction to iodine than an unfavorable one, there is little to be found in the literature concerning actually harmful reactions to iodine in the treatment of hyperthyroidism. In their original report of 600 cases of exophthalmic goiter treated with compound solution of iodine, Plummer and Boothby¹ state that no patient was made worse by iodine therapy. The

many papers that subsequently confirmed Plummer's original observations of the beneficial effects of iodine therapy furnish no instance of a severe toxic reaction to iodine. In his recent review of diseases of the thyroid gland, Boothby³ reported that more than 9,000 patients with true exophthalmic goiter had received ten drops of compound solution of iodine three times a day at the Mayo Clinic. He quotes Plummer as stating that neither he nor his associates had seen a single instance in which the reaction of the patient could be interpreted as indicating that this was too large a dose as far as the syndrome of exophthalmic goiter was concerned, although extraneous effects, such as a cutaneous rash, occasionally developed. Two recent textbooks on diseases of the thyroid gland⁴ make no mention of idiosyncrasy to iodine. Bram⁵ states that about 15 per cent of patients with exophthalmic goiter have an idiosyncrasy to iodine and become worse under its use; he gives no details as to the manifestations of this idiosyncrasy. Means,⁶ in discussing the possible ill effects of iodine, remarks that in the doses used salivation is seldom troublesome. He adds that in an occasional hypersensitive person a characteristic acneiform or pustular rash may develop but concludes that thyrotoxic patients are not more susceptible to iodine rash than any other group of patients. Means suggests that the giving of iodine may render thyrotoxic patients more prone to infections of the respiratory tract on the basis of the high incidence of sore throats among the treated patients, especially during the winter. He encountered no other difficulties in the routine use of iodine over a period of thirteen years.

Since we have been unable to find in the literature any detailed report of a febrile reaction to iodine during the treatment of hyperthyroidism, it seemed to us worth while to describe seven instances (including one fatal case) of severe febrile iodism that have been observed in hyperthyroid patients in the Johns Hopkins Hospital during the past ten years.

CASE MATERIAL

This report is based on a series of 400 hyperthyroid patients who were treated with some form of iodine medication in either the medical service or the surgical service⁷ of the Johns Hopkins Hospital during the past ten years. Significant data derived from an analysis of this series are summarized in table 1:

From the department of medicine and the medical clinic of the Johns Hopkins University Medical School and Hospital.

1. Plummer, H. S.: Results of Administering Iodine to Patients Having Exophthalmic Goiter, *J. A. M. A.* **80**:1955 (June 30) 1923. Plummer, H. S., and Boothby, W. M.: The Value of Iodine in Exophthalmic Goiter, *Coll. Papers, Mayo Clin.* **15**:565-576, 1923.

2. Lerman, Jacob: Iodine Response and Other Factors in Their Relation to Mortality in Thyrotoxicosis, *New England J. Med.* **217**:1041-1044 (Dec. 23) 1937.

3. Boothby, W. M.: Disease of the Thyroid Gland: An Interpretive Review of Progress Toward the Solution of the Problem, *Arch. Int. Med.* **56**:136-206 (July) 1935.

4. Joll, C. A.: Diseases of the Thyroid Glands with Special Reference to Thyrotoxicosis, London, William Heineman Ltd., 1932. Hertzler, A. E.: Diseases of the Thyroid Gland, ed. 3, St. Louis, C. V. Mosby Company, 1935.

5. Bram, Israel: Exophthalmic Goiter and Its Medical Treatment, ed. 2, St. Louis, C. V. Mosby Company, 1936, pp. 324, 327.

6. Means, J. H.: The Thyroid and Its Diseases, Philadelphia, J. B. Lippincott Company, 1937, pp. 355-356.

7. The department of surgery gave its permission for the inclusion of cases from the surgical service.

It is of interest that the ratio of females to males in this series is 3:1, bearing out the observations of others that the incidence of hyperthyroidism is considerably higher in the female sex. The ratio of white patients to Negro patients is also 3:1, but this does not give a fair picture of the relative frequency of the disease in the two races since the number of white patients admitted to the hospital each year is considerably larger than that of Negro patients.

By arranging the patients according to their ages, it becomes apparent that nearly 90 per cent are evenly distributed in two groups: those between 21 and 40 years of age and those between 41 and 60 years of age. There were only twenty-eight patients in the series less than 21 years of age and twenty patients more than 60 years of age.

All patients received iodine medication for three days or longer, and the patients have been further grouped according to the duration of iodine therapy. The majority of patients were given iodine for periods of from eight days to three weeks. However, fifty-one patients took iodine for four weeks or longer; one patient took the drug continuously for over a year without any untoward effects. The oral route of

even though the fever may have developed during a course of iodine medication. After all such cases had been eliminated from consideration there remained seven cases in which febrile reactions of considerable severity developed during a period of iodine therapy for no accountable reason other than idiosyncrasy to the drug. The time relationship of the administration of iodine to the onset of the fever in addition to other symptoms suggestive of iodism furnished convincing evidence that the fever was a manifestation of a reaction to iodine. These seven cases constituted 1.75 per cent of the entire series.

REPORT OF CASES

CASE 1.—History.—T. B., a schoolgirl aged 15, admitted to the medical service Aug. 8, 1930, complained of nervousness and a lump in her neck. She had always been considered a nervous child and it had been noted that she had tachycardia at an early age. The goiter was first noticed twenty months before admission. For eight months she had been quite hoarse; a tremor of her fingers developed and she lost 10 pounds (4.5 Kg.). She had never menstruated. There was no history of iodine medication prior to admission.

Examination.—The temperature was 99.4 F., the pulse 120, the respiratory rate 24 and the blood pressure 130 systolic, 70 diastolic. She was tall, thin and undeveloped (85 pounds [38.6 Kg.]); she appeared frightened and cried easily. She was very restless and perspired freely. There was a fine tremor of the tongue and fingers. The Stellwag sign was present but none of the other eye signs of hyperthyroidism were noted. The thyroid was diffusely enlarged and a soft bruit was audible over the gland. The heart was not enlarged. A rough systolic murmur was heard over the conus.

The blood count showed no anemia; the white blood cell count was 8,700 with polymorphonuclears 45 per cent, eosinophils 0, basophils 2 per cent, lymphocytes 51 per cent, monocytes 2 per cent. The urine was normal. The Wassermann reaction was negative. The basal metabolic rate was +16.

Course.—It was apparent that the girl was suffering from mild hyperthyroidism. For this reason she was given compound solution of iodine 3 cc. a day and phenobarbital as a sedative. The subsequent course of events is depicted in figure 1. Although the basal metabolic rate soon fell to 0, the pulse rate remained elevated. Seventeen days after the initial dose of iodine a slight fever developed which reached a peak of 101 F. four days later. At this time a fine maculopapular erythematous eruption appeared on the face and soft palate. Because of the rash the dose of iodine was halved and later discontinued. Cultures of the blood and urine were sterile and culture of material from the throat revealed no hemolytic streptococci. Two days before the iodine was stopped the leukocyte count was 7,100 with 10 per cent eosinophils, a finding compatible with a drug eruption. After the cessation of iodine therapy the temperature fell toward normal, the eruption faded and two weeks later the eosinophilia had disappeared. Since the administration of phenobarbital was continued throughout the entire period, this medication could scarcely be incriminated as a factor in the production of the febrile drug reaction. Because of a recurrence of the hyperthyroid symptoms and a rise in the basal metabolic rate, iodine therapy was resumed in very small dosage (0.3 cc. a day). The patient seemed to tolerate this dose very well and was discharged from the ward September 20 with instructions to continue taking iodine at home and to report to the outpatient clinic at regular intervals. She had gained 23 pounds (10 Kg.) during her six weeks' stay in the hospital and was symptomatically much improved.

Interval History.—The patient continued to take a small dose of iodine at home for six months, during which time she gained 15 pounds (6.8 Kg.) more. She then discontinued the iodine of her own accord. In October 1931 she began to have some difficulty in swallowing and breathing, owing to the increased size of the goiter. Because of these symptoms and a loss of 20 pounds (9 Kg.) she was readmitted to the hospital April 13, 1932.

TABLE 1.—Analysis of 400 Cases of Hyperthyroidism Under Treatment

Sex and race.....	Male 100 (25%)		Female 300 (75%)		
White.....	84 (21%)		216 (64%)		
Negro.....	16 (4%)		84 (21%)		
Age groups.....	Under 21 yrs.	21-40 yrs.	41-60 yrs.	Over 60 yrs.	
	28	179	173	20	
Duration of iodine therapy	3-7 Days	8-14 Days	15-21 Days	22-28 Days	29+ Days
	32	195	96	26	51
Operation.....	Subtotal Thyroidectomy		No Operation		
	358		42		
	Survived	Died	Survived	Died	
	348 (97.2%)	10 (2.8%)	40	2	

administration was employed in all cases. The iodine was given in the form of compound solution of iodine (iodine 5 Gm., potassium iodide 10 Gm. and distilled water to make 100 cc.) in 345 cases and as a saturated aqueous solution of potassium iodide (1 Gm. to 1 cc.) in forty-four cases; the remaining eleven patients received both compound solution of iodine and simple potassium iodide at different times during their hospital stay. The daily dose of compound solution of iodine ranged from 0.3 to 6 cc., the usual dose being 3 cc. a day. The dose of potassium iodide varied between 0.3 and 2 Gm. a day; the smaller dose was used for the majority of patients so treated.

Of the 400 patients 358 were subjected to subtotal thyroidectomy, with ten deaths, an operative mortality of 2.8 per cent. Forty-two patients had no operation performed; two of these patients died during their stay in the hospital.

The temperature charts of all 400 patients were reviewed for the presence or absence of fever, especially during the period of iodine therapy. We have made a particularly careful study of the records of those patients who had fever in an effort to determine the cause of the fever. If the patient had an acute streptococcal sore throat, rheumatic fever, a severe infection of the urinary tract, bacteremia or any other acute infection, such a complication was accepted as the most likely cause of the fever and the case was discarded,

Examination.—The temperature was 100.2 F., the pulse 128, the respiratory rate 28 and the blood pressure 130/40. She weighed 104 pounds (47 Kg.) and now presented the characteristic picture of severe exophthalmic goiter. The striking features were marked undernutrition, muscular weakness, extreme restlessness and emotional instability, sexual infantilism, marked exophthalmos with the associated eye signs of hyperthyroidism, enlarged tonsils, a diffusely enlarged thyroid gland with a thrill and loud bruit over it, cardiac enlargement with a systolic murmur loudest over the conus, moderate edema of the ankles and both fine and coarse tremors of the extended fingers. She was rather hoarse and laryngoscopic examination revealed that the vocal cords did not quite approximate.

The blood count showed slight anemia with red blood cells numbering 3,850,000 and hemoglobin 62 per cent, white blood cells 6,200 with polymorphonuclears 33 per cent, eosinophils 1 per cent, lymphocytes 60 per cent and monocytes 6 per cent. The nonprotein nitrogen was 20 mg. per hundred cubic centimeters, blood sugar 70 mg. and blood cholesterol 130 mg. The urine was normal. The basal metabolic rate was +53.

Course.—For the first six weeks in the hospital the patient was treated with bed rest, a high caloric diet and sedatives. On this regimen the basal metabolic rate dropped to +28 but

tive course made an excellent recovery. She has remained in good health during the past six years.

This case has been reported in considerable detail because febrile reactions to iodine therapy developed on two separate occasions nearly two years apart. The time relationship between the administration of iodine and the onset of fever in each instance made it appear highly probable that the iodine was in some way responsible for the fever. The absence of any other obvious cause for fever gave further support to such a view. With the first bout of fever a cutaneous eruption and distinct eosinophilia developed; no rash appeared during the second episode of fever. Later she was given a very short course of iodine (during which she remained afebrile) prior to double partial lobectomy, and she made an excellent recovery following the operation.

CASE 2.—History.—E. J., a Negro school girl aged 15, admitted to the medical ward Oct. 17, 1931, complained of "goiter" and "nervousness." One sister had been operated on for thyroid disease at the age of 15. The patient's past history

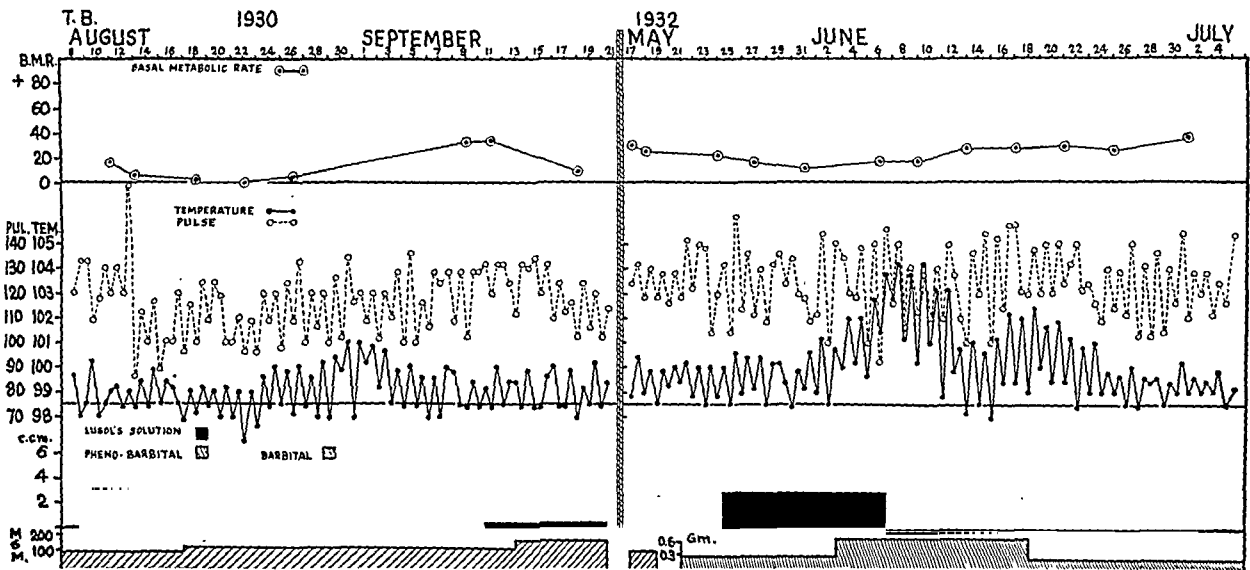


Fig. 1 (case 1).—The course of the temperature, pulse and basal metabolic rate.

the tachycardia persisted. The temperature had not risen above 101 F. during this period. May 24 compound solution of iodine was started in the usual dose of 3 cc. a day. On the eighth day of medication the patient's temperature began to rise and subsequently reached peaks of 104 on two separate occasions (fig. 1). The fever was accompanied by a few constitutional symptoms such as mild conjunctivitis and arthralgias. The throat was slightly injected but there was no cutaneous eruption. The leukocyte count remained normal; unfortunately no differential count was made during the febrile period. Cultures of the blood, urine and throat gave no evidence of an acute infection. Finally, June 7 the compound solution of iodine was discontinued and the temperature gradually fell to its original level. The only other medication that she had received during this period was barbitals, and the temperature returned to normal in spite of the continued use of this sedative. Because of the episode of high fever, which was regarded as a reaction to iodine, the patient was treated symptomatically with sedatives and warm tubs for the next four months. During this period she remained afebrile, her weight increased to 150 pounds (68 Kg.) and the basal metabolic rate fell to +5. Finally, beginning October 8 she was again given compound solution of iodine 1.8 cc. a day for the next five days, with no apparent reaction. October 13 a double partial lobectomy was performed under avertin-ether anesthesia. The patient stood the operation well and after a rather stormy postopera-

was noncontributory. For four months she had noticed tremor and nervousness and for three months she had complained of palpitation, insomnia, increased appetite and progressive swelling of the neck. She had lost 6 pounds (2.7 Kg.) in three months. Two weeks after the onset of her symptoms she consulted her physician, who gave her "some black drops, like iodine."

Examination.—The temperature was 99 F., the pulse 140, the respiratory rate 24 and the blood pressure 160/70. The patient appeared nervous. There were both fine and coarse tremors of the tongue and outstretched fingers and there were definite exophthalmos and lagging of the lid. The thyroid gland was diffusely enlarged; there were a palpable thrill and an audible bruit over the gland. The heart was enlarged and a gallop rhythm was noted.

There was no anemia. The white blood cell count was 6,200 with a normal differential formula, there being only 1 per cent eosinophils. The Wassermann reaction was negative. The basal metabolic rate was +23.

Course.—The patient was kept in bed; during the first two weeks she received no medication other than phenobarbital (160 mg. daily). The phenobarbital was then discontinued and she was given 3 cc. of compound solution of iodine a day. Immediately her temperature began to rise, reaching a peak of 105 F. on the ninth day of iodine treatment (fig. 2). On the fifth day the patient's throat became sore and in

and the cervical lymph nodes were palpable. The white blood count was 7,300. The lungs were clear. Cultures of material from the throat revealed no beta hemolytic streptococci or Klebs-Löffler bacilli, and stool culture, blood culture and the Widal reaction were all negative. On the eighth day a transitory papulomacular rash appeared over the back of the hands, the white blood cell count rose to 12,200 and the differential count showed 4 per cent eosinophils.

The administration of compound solution of iodine was discontinued on the ninth day, the temperature fell abruptly and the cutaneous rash promptly disappeared. The patient was operated on five days later and made an uneventful recovery.

CASE 3.—History.—H. R., a carpenter aged 33, was admitted to the hospital Feb. 12, 1932, with a history of nervousness, irritability, dizziness, inability to sleep well, palpitation, exertional dyspnea and increased sweating for nearly eight years. He had gradually lost 40 pounds (18 Kg.) in spite of increased

appetite and consumption of food. He had been taking an iodine preparation for about six weeks prior to admission.

Examination.—The temperature was 98.6 F., the pulse 74, the respiratory rate 20 and the blood pressure 140/70. The principal aspects were evidence of loss of weight, restlessness, tremors of the tongue and fingers, exophthalmos with the other eye signs of hyperthyroidism, moderate diffuse enlargement of the thyroid gland and slight cardiac enlargement. The pulse was regular.

The blood count showed no anemia; the white blood cells numbered 5,000 with 45 per cent lymphocytes and no cosino-

phils. The urine was normal. The basal metabolic rate was +40. The Wassermann reaction was negative.

Course.—Two days after admission a course of compound solution of iodine 3 cc. a day was prescribed, along with running doses of phenobarbital as a sedative. On the third day of iodine the patient's temperature began to spike, reaching 101 F. that evening and 103 three days later (fig. 3). The patient's throat was sore and injected; no exudate was seen

and the culture was negative for beta hemolytic streptococci. The cervical nodes were enlarged. The skin was hot and flushed but no definite eruption was noted. February 19 the leukocyte count was 5,100 with polymorphonuclears 69 per cent, eosinophils 2 per cent, lymphocytes 26 per cent and monocytes 3 per cent. Three days later the compound solution of iodine was discontinued and the high spiking fever immediately gave way to a low grade fever which persisted for a month. The basal metabolic rate remained quite high during this period. March 1 auricular fibrillation set in. A second course of compound solution of iodine 3 cc. a day was started March 22; the medication was continued for two weeks without fever or other reaction, and a double partial lobectomy was performed April 5. The patient made an uneventful recovery and was discharged ten days later.

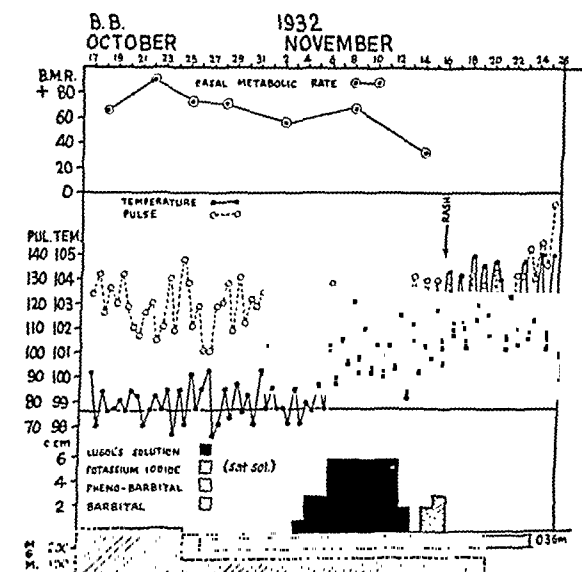


Fig. 4 (case 4).—The course of the temperature, pulse and basal metabolic rate.

edema of the ankles and dyspnea on exertion. Later moderately severe diarrhea developed. In spite of an increase in appetite he had lost 40 pounds in six months. There was no history of iodine medication prior to admission.

Examination.—The temperature was 98.6 F., the pulse 130, the respiratory rate 25 and the blood pressure 180/80. The patient was emaciated and restless, with marked tremors. He perspired very freely. The eyes were prominent with a distinct stare and weakness of convergence. The thyroid showed slight diffuse enlargement with a thrill and bruit. The heart was enlarged and its action tumultuous. There was a loud systolic murmur at the apex. The rhythm was regular. The liver and spleen were not felt and there was no lymphadenopathy.

The blood count was essentially normal with red blood cells numbering 4,300,000, hemoglobin 88 per cent, white blood cells 7,300 with a normal differential formula (70 per cent polymorphonuclears, no eosinophils). The urine was normal. The Wassermann reaction was negative. The basal metabolic rate was +66.

Course.—The entire course in the hospital is portrayed in figure 4. Treatment at first consisted of bed rest, a 5,000 calory diet, bismuth subcarbonate and camphorated tincture of opium for the diarrhea, and both barbitol and phenobarbital as sedatives. During this period the rectal temperature never

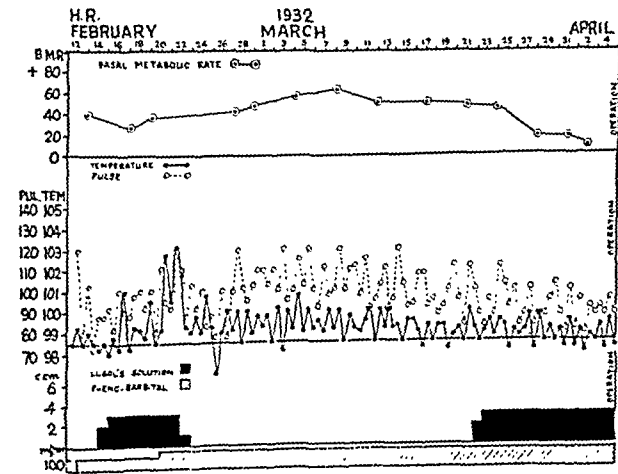


Fig. 3 (case 3).—The course of the temperature, pulse and basal metabolic rate.

phils. The urine was normal. The basal metabolic rate was +40. The Wassermann reaction was negative.

Course.—Two days after admission a course of compound solution of iodine 3 cc. a day was prescribed, along with running doses of phenobarbital as a sedative. On the third day of iodine the patient's temperature began to spike, reaching 101 F. that evening and 103 three days later (fig. 3). The patient's throat was sore and injected; no exudate was seen

rose above 100.2 F. November 4 iodine therapy was commenced in the form of compound solution of iodine 3 cc. a day. Two days later the temperature rose to 101.2 F. in the evening; since iodism was suspected, the dose of compound solution of iodine was doubled the following day in the hope of alleviating the symptoms. This was done on the basis of

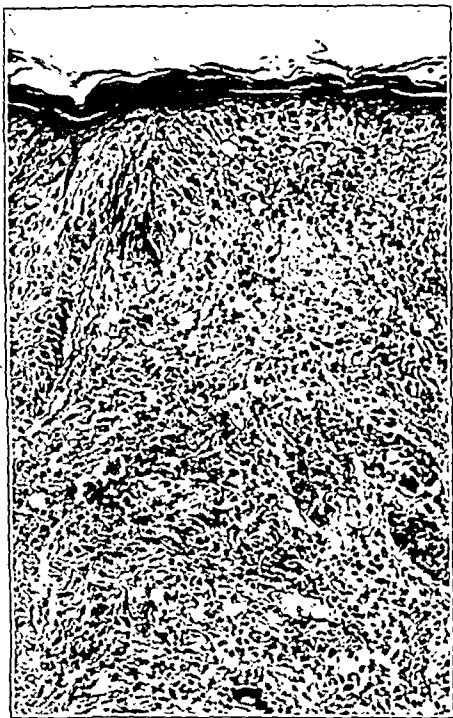


Fig. 5 (case 4).—Infiltration of skin ($\times 100$).

reports⁸ that the symptoms of iodism may frequently be overcome by doubling the dose of iodine. However, the patient's temperature remained elevated, reaching 103 on the fifth day of iodine, at which time he complained of itching over his back. November 13 (the ninth day of iodine) the leukocyte count was 9,700 with the following differential count: polymorphonuclears 65 per cent, eosinophils 11 per cent, basophils 1 per cent, lymphocytes 22 per cent, monocytes 1 per cent. Because of the eosinophilia and persistent fever the compound solution of iodine was discontinued. November 15 the patient was given 2 cc. of a saturated solution of potassium iodide and the following day 3 cc. of the same preparation. The solution of potassium iodide was given in the hope that the patient would tolerate the iodine in this form better than in the form of compound solution of iodine. The result was disastrous, for the temperature spiked to 104.2 F. on the second day, concomitant with the appearance of a dense papular rash over the trunk. The rash consisted of dull reddish papules from 2 to 4 mm. in diameter, which were almost conglomerate in places. The mouth was dry and there was a hemorrhagic plaque in the mucosa of the palate. Coryza was marked and the pharynx appeared fiery red. The potassium iodide was discontinued but the patient continued to grow rapidly worse. November 17 the eruption had spread to include the face and extremities as well as the trunk; it was most dense over the chest and shoulders. The buccal mucosa was very red and studded with petechiae. The patient complained of aching in his joints. Culture of material from the throat revealed no beta hemolytic streptococci or diphtheria bacilli. The high fever and eruption persisted up to the patient's death. Four days before death there was desquamation of the tongue and palate; the leukocyte count was 12,300 with 22 per cent eosinophils. Two days later there was generalized desquamation of the rash. Blood cultures were sterile. Treatment consisted of purely supportive measures such as calamine lotion locally,

tubs, parenteral and rectal fluids, sedatives and finally an oxygen tent. These were of no avail, as the patient rapidly lost ground, became disoriented, vomited repeatedly, lapsed into coma and died November 25, three weeks after the initial dose of iodine.

Autopsy.—This was performed thirty-nine hours after death.⁹ The gross anatomic appearances observed at this time were as follows:

The skin was generally covered with a desquamating maculopapular rash. Most of the papules were from 1 to 2 mm. in diameter; they were a little darker than the skin and were covered with a fine grayish opaque dustlike desquamating layer.

The tongue was bright red with a fresh ulcer at the base. The epiglottis was fiery red and somewhat edematous. The mucosa of the larynx, trachea and bronchi was much reddened and there were little flecks of grayish white exudate on the surface.

Both lobes of the thyroid were moderately enlarged, each lobe measuring 6.5 by 3.5 by 3 cm. On section the tissue was firm and rather dry, and throughout there were many gray-white opacities. The thymus was enlarged, weighing 25 Gm.

The lymph nodes were distinctly enlarged with individual nodes up to 4 cm. in diameter.

The heart weighed 330 Gm.; there was some narrowing of the coronary arteries but no occlusion. There was moderate arteriosclerosis of the aorta and its larger branches; the changes did not suggest syphilitic aortitis.

The lungs showed congestion of the lower lobes with patches of lobular pneumonia and some areas suggesting hemorrhage. The bronchi and bronchioles were all bright red and contained a grayish white exudate.

The liver weighed 1,630 Gm. There were no stones in the gallbladder. Over the surface of the liver and on section numerous small yellow patches up to 1 cm. in diameter were seen.

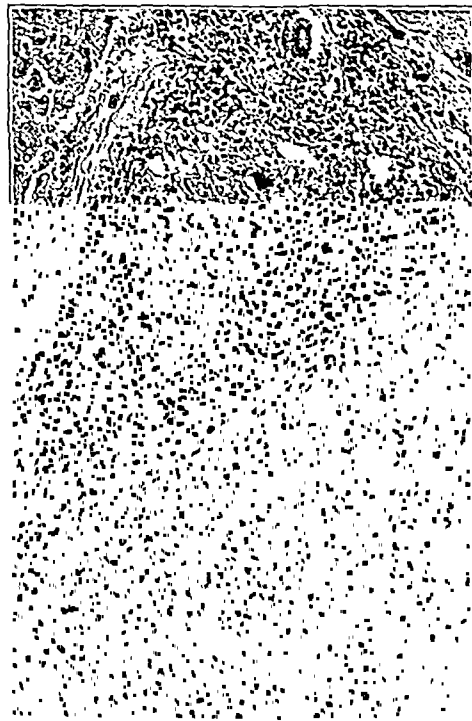


Fig. 6 (case 4).—Perivascular inflammatory lesion in a periportal space in the liver ($\times 100$).

The spleen was much enlarged, weighing 370 Gm. There were many mottled reddish yellow patches in the capsule. On section the pulp bulged; the malpighian bodies were very large.

There were small hemorrhages in the gastric mucosa.

8. Moore, J. E.: *The Modern Treatment of Syphilis*, Springfield, Ill., Charles C. Thomas, Publisher, 1933.

9. The autopsy was performed by Dr. Samuel Blackman, offered criticisms and suggestions in the preparation of this edition of the pathologic aspects.

The kidneys were very red, the pelvis hyperemic. The bladder showed cystitis cystica and the tunica vaginalis of the testes was fiery red.

Microscopic sections showed changes in the thyroid gland typical of hyperthyroidism. Of chief interest were the miliary inflammatory perivascular lesions that were present in the majority of the tissues (figs. 5, 6, 7 and 8). These lesions were found in the lymphoid tissues at the back of the tongue and about little blood vessels and tufts of mucous glands deep in the tongue. In the lymph nodes and spleen there were many such lesions usually occupying the position of the germinal centers. Some were found in the lung about the bronchioles. In the liver circumscribed lesions were found in practically every portal space. There were a few similar lesions in the heart muscle,¹⁰ while in the media of the aorta they were very numerous. Many were found in the kidney, where they were located about small arterioles. The sections of the stomach showed some lesions about the blood vessels in the muscularis. In the skin the lesions were not so definitely circumscribed, but the whole corium was diffusely infiltrated with mononuclear cells, lymphoid and plasma cells and occasional eosinophils; there was some accentuation about blood vessels, sweat and sebaceous glands and the tips of the epithelial papillae.

The nature of the lesions was practically the same in all these locations. They consisted mainly of mononuclear cells; also in most of the lesions there were lymphocytes and a few eosinophils. Often there were epithelioid cells arranged as they are in tubercles, and in many of the organs some lesions contained typical Langerhans giant cells. Certain of the lesions, especially in the spleen, showed a central area of necrosis. No spirochetes were demonstrated by dark field examination or in stained smears; neither tubercle bacilli nor other bacteria were found in any of the lesions. The nature of these lesions

of the lymphoid tissue and some fresh hemorrhages. The sinuses contained an abundance of mononuclear cells. The femur marrow was fatty; the vertebral marrow was somewhat hypoplastic with suggestive areas of necrosis.

The final anatomic diagnosis was hyperplasia of the thyroid; enlargement of the thymus; slight cardiac hypertrophy; scars in the myocardium; peculiar miliary lesions of necrosis and

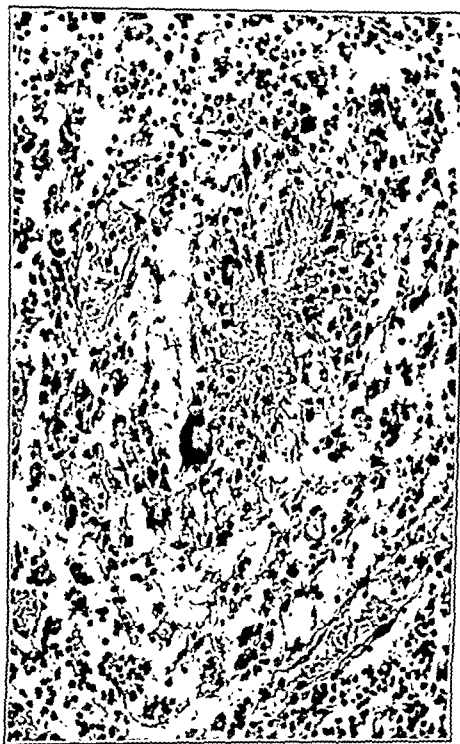


Fig. 8 (case 4).—Lesion in a lymph node showing central necrosis and giant cells (×200).

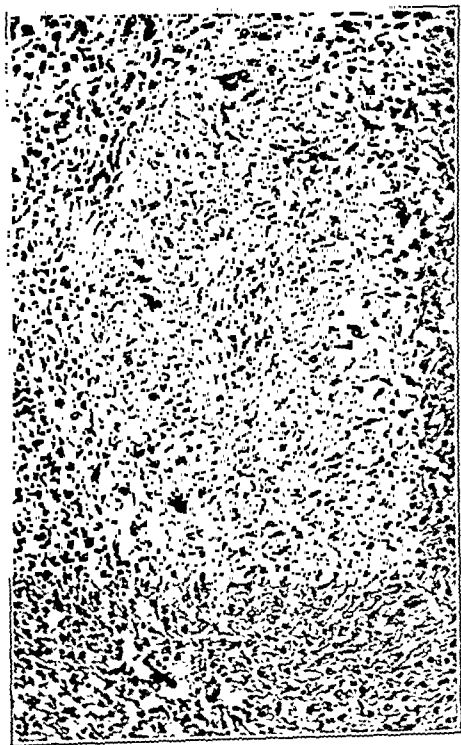


Fig. 7 (case 4).—Lesion in the spleen with central necrosis (×200).

was obscure. It was suggested, in view of the clinical record, that the lesions were actual results either directly of iodine or of allergy to a combination of iodine with some protein.

In addition to the peculiar circumscribed inflammatory lesions described, the following results of microscopic examination were of some interest: The lymph nodes showed hyperplasia

inflammation with eosinophils in the skin, tongue, tonsils, lungs, lymph nodes, spleen, liver, kidneys, ureters, epididymides, testes, prostate, stomach, heart and aorta; acute splenic tumor; eosinophilia (blood); acute tonsillitis; great enlargement of the lymph nodes; purulent bronchitis; hemorrhages in the lungs, and scars in the pleura.

This patient, suffering from severe hyperthyroidism, had a high fever and a dense papular rash associated with marked eosinophilia during a course of iodine therapy. Although all iodine was eventually discontinued, the fever persisted and the patient grew rapidly weaker and died twenty-one days after the initial dose of iodine. Autopsy revealed miliary inflammatory perivascular lesions throughout the majority of the tissues of the body.

CASE 5.—History.—D. H., a married woman aged 53, admitted to the medical ward Feb. 23, 1938, complained of "heart trouble" of five years' duration. She had had "growing pains" at the age of 9 but there was no history of chorea or swollen tender joints. Thirteen years before admission to the hospital she had first noticed palpitation and swelling of the neck. Eight years later she was forced to go to her physician because of shortness of breath. He told her that she had rheumatic heart disease and treated her with digitalis. Five months before admission the patient had an attack of tonsillitis, and a month later dyspnea, palpitation, weakness and nervousness became severe. In spite of a ravenous appetite she lost 30 pounds (13.6 Kg.). She continued to take digitalis until three weeks before admission, at which time she took an iodine preparation for one week with apparently no ill effects.

Examination.—The temperature was 100.8 F., the pulse 130, the respiratory rate 30 and the blood pressure 140/80. The patient was gaunt, emaciated and extremely nervous with a

10. On the basis of these lesions this case was included in a group reported as showing granulomatous myocarditis (Jonas, A. F., Jr.: Granulomatous Myocarditis, *Bull. Johns Hopkins Hosp.* 64:45-66 [Jan.] 1939).

noticeable coarse tremor of the hands. The eyes converged poorly and there was very slight exophthalmos. The right lobe of the thyroid gland was greatly enlarged and was firm to palpation. No thrill or bruit was present. There were signs of fluid at the base of the right lung. The heart was enlarged to percussion and the rhythm was grossly irregular. There was a systolic murmur and at the pulmonic area both systolic and diastolic murmurs were audible and the second pulmonic sound was greatly accentuated. The veins of the neck were distended and the liver and spleen were moderately enlarged. There was no peripheral edema.

Examination of the blood revealed no anemia; the white blood cell count was 12,920 with a normal differential count and no eosinophils. There was a trace of albumin in the urine. The basal metabolic rate was +83. The Wassermann reaction was negative.

At the time of admission the diagnosis was made of nodular goiter with hyperthyroidism, congenital heart disease (probably patent ductus arteriosus or patent foramen ovale), auricular fibrillation, congestive heart failure and right hydrothorax.

Course.—The patient responded well to routine therapy for heart failure, consisting of bed rest, limitation of fluids and digitalis. Eight hundred cc. of fluid was removed from the right side of the chest by thoracentesis. After one month at bed rest the patient's basal metabolic rate had fallen to +61. It had been noticed, however, that the iodine used to clean the arm for venipuncture caused a rather severe local dermatitis. For this reason patch tests were performed with both potassium iodide and compound solution of iodine. The patient was sensitive to both and iodine therapy was thought to be contraindicated. The thyroid gland was therefore irradiated (ten treatments of 195 roentgens each) without any noticeable effect on the basal metabolic rate. After the patient had been in the hospital for two months the patch test with potassium iodide (20 per cent) was repeated and on this occasion was negative. Potassium iodide treatment was started, the dose being gradually increased to 2 Gm. a day. The basal metabolic rate fell rapidly to +31 and the patient seemed greatly improved. However, on the eighteenth day of iodine treatment the temperature rose suddenly to 102.4 F. (fig. 9) and a sore throat and coryza developed. The following day she was given a single dose of 0.6 Gm. of potassium iodide and her temperature rose further to 104.2 F. There was no cutaneous rash or glandular enlargement. The white blood count was 7,500 and the differential count was normal, with only 1 per cent eosinophilic cells. Cultures of the blood and of material taken

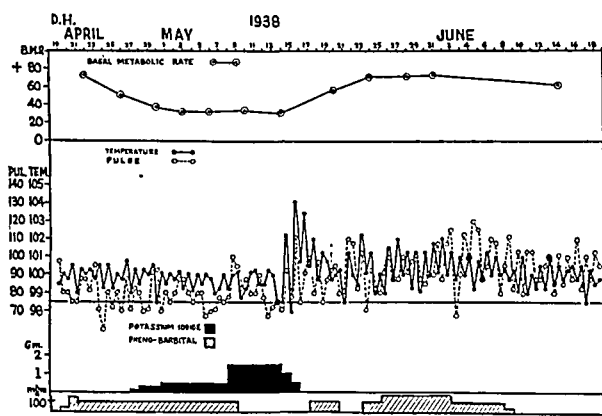


Fig. 9 (case 5).—The course of the temperature, pulse and basal metabolic rate.

from the throat were sterile and x-ray films of the lungs and sinuses were clear. Culture of the urine showed a light growth of *Bacillus coli* but there were no urinary symptoms and there was no tenderness of the costovertebral angle. During the five weeks following the sharp febrile reaction the patient continued to have a low grade fever although she was given no further iodine; her basal metabolic rate again became greatly elevated, she continued to lose weight and finally, June 18, she was discharged from the hospital to return later for operation after a prolonged rest period at home.

CASE 6.—History.—B. F., a housewife aged 57, admitted to the medical service June 6, 1938, complained of nervousness and palpitation. Her family and past histories were noncontributory. Eighteen months before admission she noticed increasing weakness, palpitation and a gradual swelling of the neck. At this time she began to lose approximately 2 pounds (900 Gm.) a week and noticed that her eyes were becoming

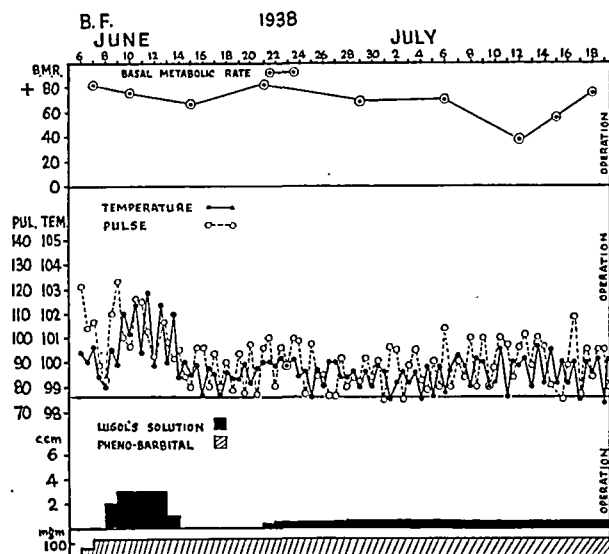


Fig. 10 (case 6).—The course of the temperature, pulse and basal metabolic rate.

more prominent. Twelve months before admission her physician treated her with ultraviolet rays and a salty medicine (probably potassium iodide) but she improved very little. During the last four months before admission to the hospital all her symptoms became more severe and she suffered from moderate diarrhea.

Examination.—The temperature was 99.6 F., the pulse 118, the respiratory rate 26 and the blood pressure 140/80. The patient was very nervous and slightly undernourished, with marked exophthalmos and a noticeable lagging of the lid. The thyroid gland was diffusely enlarged and there was a loud bruit heard over both lateral lobes. The heart was slightly larger than normal, but the rhythm was regular and there was no evidence of congestive heart failure. There was a fine tremor of the fingers.

The blood count showed no anemia. The white blood cell count was only 3,200, although the differential count was essentially normal. The Wassermann reaction was negative. The basal metabolic rate was +83.

Course.—On the third day in the hospital compound solution of iodine was started and the patient was given 3 cc. a day for a period of six days. On the second day of treatment her temperature rose and remained elevated during the entire period of treatment (fig. 10) but fell abruptly to normal as soon as the drug was discontinued. During the period of fever the patient had no complaints. There was no cutaneous eruption, cultures of the blood and urine were sterile and an x-ray film of the chest was clear. There was no leukocytosis; a differential count was not made. After the temperature had remained normal for one week the compound solution of iodine was given again, this time in doses of only 0.6 cc. a day. A low grade fever developed and persisted during the next six weeks of treatment, but at the end of this time the patient was operated on and made an uneventful recovery. She was given daily doses of phenobarbital as a sedative throughout her stay in the ward.

CASE 7.—History.—M. K., a school girl aged 20, admitted to the hospital June 16, 1938, complained of nervousness. The family and past histories were noncontributory. There was no history of rheumatic fever. Eighteen months before admission the patient noticed nervousness, palpitation and tremor of the hands. Her physician treated her for one week with brown

pills (? iodine), which caused a marked relief from symptoms. One month before admission, following a quarrel in her household, she noticed a rapid return of her former nervousness, palpitation and tremors. She did not lose weight but suffered from diarrhea for three days before entering the hospital.

Examination.—The temperature was 99.2 F., the pulse 104, the respiratory rate 20 and the blood pressure 160/80. The patient was well developed, well nourished and somewhat nervous, with very noticeable flushing of the skin over her face, neck and arms. There was no exophthalmos, and none of the usual eye signs of hyperthyroidism were present. The thyroid gland was diffusely enlarged and there was a loud systolic bruit heard over both lateral lobes. The heart was definitely enlarged, the second pulmonic sound was accentuated and there was a loud gallop rhythm. There were no signs of congestive heart failure and the rhythm was regular.

The red blood cell count and hemoglobin were normal. The white blood cell count was 6,400, with a normal differential count; no eosinophilic leukocytes were seen in the blood smear. The Wassermann reaction was negative. The basal metabolic rate was +49. Blood cholesterol was 135 mg. per hundred cubic centimeters.

the cutaneous rash two weeks, and the jaundice did not completely subside for nearly a month later. The patient was kept at complete bed rest for more than a month after all signs of the reaction to the iodine had subsided, but the basal metabolic rate remained elevated above +60. Finally, September 15 a right partial lobectomy was done under local anesthesia. The patient stood the operation well and the postoperative course was uneventful. At the time of discharge from the hospital (October 1) the patient's basal metabolic rate was +46. After eight weeks at home she was readmitted to the hospital November 28 and the left lobe of the thyroid was removed. Following the second operation the basal metabolic rate fell to +9 and she was discharged from the hospital on December 6, much improved.

COMMENT

A number of the more significant features observed in the seven instances of severe febrile iodism which occurred in a series of 400 hyperthyroid patients treated with iodine are summarized in table 2.

No definite predisposing factors were brought out. Neither sex nor race appeared to be a factor, for five

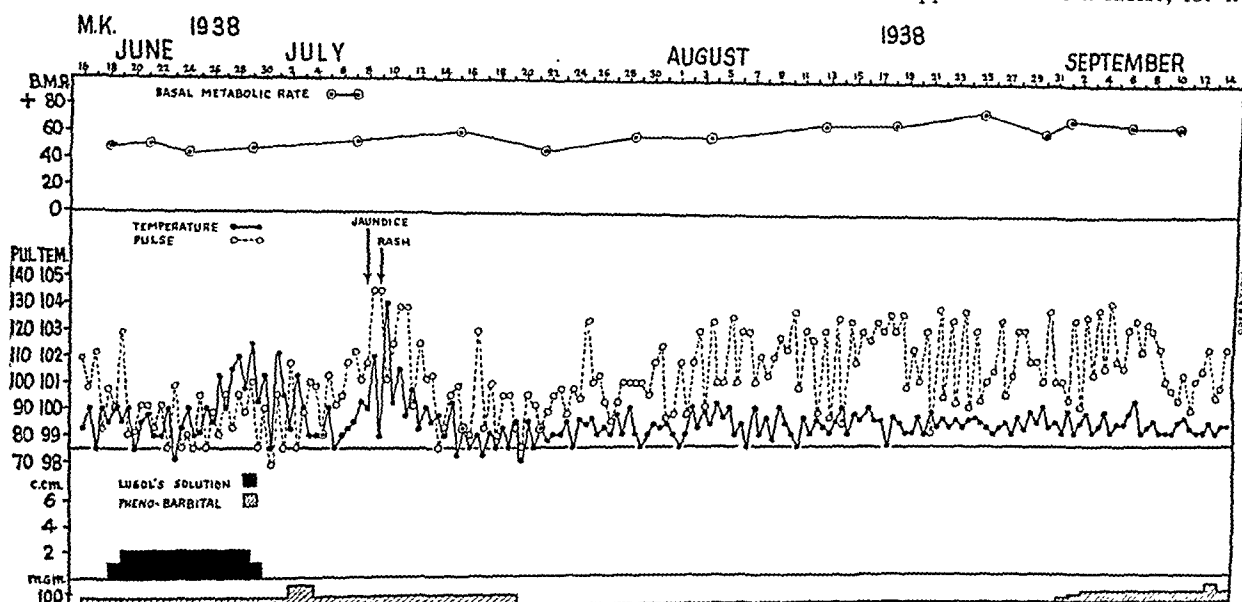


Fig. 11 (case 7).—The course of the temperature, pulse and basal metabolic rate.

Course.—The patient was given compound solution of iodine 3 cc. a day, and on the ninth day of treatment fever developed (fig. 11). Two days later (June 29) the iodine therapy was discontinued. July 1 the temperature rose to 101.4 F. There was a definite conjunctivitis with photophobia and marked generalized glandular enlargement. The patient did not complain of a sore throat but the pharynx was injected. The white blood cell count was only 5,200 but the differential count revealed an eosinophil count of 16 per cent. The lungs were clear and cultures of material from the throat and of the urine and stool revealed no cause for the fever. By July 5 the temperature had returned to normal and the conjunctivitis had subsided. The white blood cell count was 6,000 with 9 per cent eosinophils. After three days of normal temperature there was a sudden rise on July 8 to 102 F.; the patient complained of diarrhea and it was noticed that she was becoming jaundiced. The icterus index of the blood serum was found to be 20, there was no anemia, the white blood cell count was 6,800 and there were still 6 per cent eosinophils. The liver was palpable at the costal margin and was quite tender. The following day (July 9) a papular erythematous rash appeared over the face, neck, arms, upper part of the chest and ankles. The urine contained both bile and urobilin and the van den Bergh determination on the blood serum gradually rose to a maximum of 5 mg. per hundred cubic centimeters (prompt biphasic reaction) on July 18. The fever lasted one week and

of the seven patients were females and five of the seven were white, which ratios are roughly proportional to the racial and sexual distribution of the entire series. The fact that three of the patients were under 21 years of age suggests that young patients may be somewhat more susceptible to such reactions, since only twenty-eight patients, or 7 per cent of the entire series, were under 21 years of age. The level of the basal metabolic rate varied from +16 to +83 at the time iodine therapy was started. All seven patients presented the clinical picture of moderate to severe hyperthyroidism.

A definite history of previous iodine medication was obtained in only two cases but was suspected in three others. In two cases there was no suggestion of iodine therapy prior to admission to the hospital. The form in which iodine was being administered when the febrile reaction developed seemed to be of no importance. Five patients received only compound solution of iodine, whereas one received only potassium iodide; one patient was given first compound solution of iodine and later potassium iodide. The dose of iodine was not excessively large or small in any case.

The temperature had begun to rise on or before the fourth day of iodine therapy in four cases. In the

other three cases the hyperpyrexia first appeared considerably later. The peak of the fever was reached within several days of the onset and varied between 101 and 105 F. In three cases the temperature returned to normal within several days after iodine had been discontinued, whereas in four instances fever persisted for periods of from ten to thirty days after the cessation of therapy.

In addition to fever, other manifestations of iodism, such as cutaneous eruptions, conjunctivitis, coryza, pharyngitis and enlargement of the lymph nodes were common. Cutaneous eruptions occurred in four cases; the rash in each instance consisted of small erythematous papules involving chiefly the face, chest and upper extremities. It is of interest that in case 1 a rash accompanied the first febrile reaction to iodine but did not develop during the second more severe episode of

became recognizable. Thus eosinophilia in association with fever may serve as an early warning to discontinue iodine.

Since the clinical manifestations in these seven cases were characteristic of idiosyncrasy to a drug, a careful investigation was made of other drugs that the patients were receiving when symptoms of idiosyncrasy developed. It was found that at some time during their hospital stay all seven patients received barbiturates in the form of barbital, or more commonly phenobarbital—drugs which may occasionally give rise to cutaneous eruptions. However, as shown in the charts, the onset and subsidence of the fever and associated symptoms bore no definite time relation to the administration of these sedatives. In five cases barbiturates were continued throughout the period of fever and for a considerable time thereafter, whereas in two cases (2 and

TABLE 2.—Significant Features of the Seven Cases of Febrile Iodism

Case	Race, Sex and Age	Pre-vious Iodine	Basal Meta-bolic Rate	Form and Daily Dose of Iodine	Day of First Fever	High-est Fever	Rash	Con-junc-tivitis	Coryza and Pharyn-gitis	En-larged Nodes	White Blood Cells	Eosino-philis, per Cent	Barbi-turates	Comment
1. T. B.	(a) White ♀ 15	No	+16	Compound solution of iodine 3 cc.	17	101	+	0	0	0	7,100	10	+	Compound solution of iodine discontinued; temperature returned to normal
	(b) 17	Yes	+53	Compound solution of iodine 3 cc.	8	104	0	+	+	0	6,500	?	+	Compound solution of iodine stopped; temperature returned to normal; short third course of iodine and successful operation 4 months later
2. E. J.	Negro ♀ 15	Yes (?)	+23	Compound solution of iodine 3 cc.	4	105	+	0	+	+	12,200	4	+	Compound solution of iodine stopped; temperature returned to normal; successful operation 5 days later
3. H. R.	White ♂ 33	Yes	+40	Compound solution of iodine 3 cc.	3	103	0	0	+	+	5,100	2	+	Compound solution of iodine stopped; second course for 2 weeks before operation without reaction; successful operation
4. B. B.	Negro ♂ 56	No	+66	(a) Compound solution of iodine 3-6 cc. (b) Potassium iodide 2-3 Gm.	2	104.8	+	+	+	+	12,300	22	+	Vomiting, coma and death on 21st day; autopsy
5. D. H.	White ♀ 53	Yes	+83	Potassium iodide 0.3-2 Gm.	18	104.2	0	+	+	0	7,500	1	+	Potassium iodide stopped; fever continued; patient lost ground; discharged without operation
6. B. F.	White ♀ 57	Yes (?)	+53	Compound solution of iodine 3 cc.	2	102.8	0	0	0	0	5,000	?	+	Compound solution of iodine stopped; temperature returned to normal; slight fever with 2d course of iodine; successful operation
7. M. K.	White ♀ 20	Yes (?)	+49	Compound solution of iodine 3 cc.	9	104	+	+	+	+	5,200	16	+	Compound solution of iodine stopped; fever continued; jaundice developed; no further iodine; successful 2 stage operations 2 and 4 months later

fever nearly two years later. Definite conjunctivitis was present in four cases, coryza and pharyngitis in six cases, and enlargement of the lymph nodes in four cases.

In one case well marked jaundice developed, apparently from a toxic hepatitis, while the rash was still present. The jaundice persisted for nearly a month.

In one case (6) the fever, unaccompanied by other manifestations of iodism, furnished the only evidence of a reaction to iodine.

The leukocyte count remained normal in five cases; two patients showed a slight leukocytosis, just over 12,000 white blood cells per cubic millimeter. Eosinophil counts of from 4 per cent to 22 per cent developed in the four cases presenting cutaneous eruptions, but eosinophilia was absent in two cases in which there was no rash. Unfortunately no differential count was made in case 6 or case 1 during the second episode of iodine fever. Some importance may be attached to the fact that in two cases (4 and 7) the eosinophil count had risen well above normal before a definite rash

5) no barbiturates were being taken at the time the fever developed. Moreover, 95 per cent of the remaining 393 patients in the series received barbiturates and no untoward effects were noted other than an occasional mild afebrile cutaneous eruption.

The subsequent course of each of the seven patients in whom severe symptoms of idiosyncrasy to iodine developed has been briefly summarized in table 2. Four patients received no further iodine; two of these were successfully operated on after the fever and associated symptoms had subsided. Operation for the third patient was considered too hazardous in view of her poor cardiac condition, and she was discharged from the hospital to rest at home. The course in the fourth case was rapidly downhill to death as a result of the severe febrile reaction to iodine. The remaining three patients after a suitable rest period were given another course of iodine just prior to operation; two showed no febrile reaction while the third developed a low grade fever. Each of these survived double partial lobectomy and made an excellent recovery.

The one fatal case is of particular interest in view of the widespread lesions throughout the organs of the body noted at autopsy. The course of events in this case serves to emphasize the danger of continuing iodine once manifestations of idiosyncrasy have made their appearance.

Iodism, or idiosyncrasy to iodine, has long been recognized as an accident which is likely to occur in a small proportion of patients treated with iodine or iodides. The majority of cases that have been reported developed during the course of antisyphilitic therapy. In his review of iodide therapy in syphilis Snodgrass¹¹ states that iodism is of common occurrence if the oral route of administration is used. He noted iodism in 12 per cent of cases when the initial dose was 5 grains (0.32 Gm.) or less but in less than 1 per cent if the initial dose was more than 30 grains (2 Gm.). He made no mention of fever as a symptom of iodism. Katzenstein¹² states that fever is not an uncommon accompaniment of other manifestations of iodide intoxication but that it has seldom been observed as the only evidence of iodism, as was the case in two instances he reports. Moore⁸ has seen uncomplicated fever produced by iodides in a few instances, particularly in cases of hepatic syphilis. He notes that some observers have ascribed this fever to the absorption of necrotic tissue but adds that this is probably not the correct explanation, as he has seen a precisely similar febrile reaction from the use of small doses of compound solution of iodine in nonsyphilitic patients with exophthalmic goiter. Incidentally, this is the only specific mention of febrile reactions to iodine in hyperthyroidism that we have been able to find in the literature.¹³

There is no obvious reason why febrile iodism should not develop in hyperthyroid patients, and it seems strange that so little attention has been directed toward this form of idiosyncrasy in the past. It is quite possible that certain of the febrile attacks of acute pharyngitis reported by Means may well have been instances of mild iodism which passed unrecognized.

Hoke¹⁴ and Wolfsohn¹⁵ have reported that practically all hyperthyroid patients tested gave positive cutaneous reactions to intracutaneous injections of sodium iodide. Since this reaction was so generalized, it would appear that increased irritability of the skin was responsible rather than actual allergy to iodine, as suggested by Wolfsohn.

Fatal iodism, such as occurred in one of our cases, must be extremely rare. The majority of the fatalities attributed to iodine fall into one of two groups: (1) overwhelming intoxications from the accidental or intentional ingestion of a large quantity of iodine¹⁶ or (2) pustular or bullous ioderma which occasionally develops in patients who have taken iodides over long periods.¹⁷ The only fatal case that we have found which resembles ours was reported by Mi and Yang:¹⁸ A patient who had been given potassium iodide over a period of fifty-four days for the treatment of a

traumatic hemorrhage in the eye developed a high fever, erythema, abdominal pain and vomiting; he died in coma on the fifth day. No postmortem examination was obtained in this case.

SUMMARY AND CONCLUSIONS

1. Seven instances of severe febrile iodism occurred in a series of 400 patients with hyperthyroidism treated with iodine, an incidence of 1.75 per cent.

2. Fever, cutaneous eruptions, coryza, pharyngitis, enlargement of the lymph nodes and eosinophilia were common manifestations. Jaundice developed in one case.

3. The pathologic changes in the single fatal case consisted essentially of miliary inflammatory perivascular lesions, which were present in the majority of the tissues.

4. The continuation of iodine after marked symptoms of idiosyncrasy have developed may be extremely dangerous.

5. Subsequent administration of iodine to patients in whom iodism has developed in the past may or may not give rise to a second febrile reaction.

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POSTPARTUM URINARY SUPPRESSION

RESEMBLING BILATERAL CORTICAL NECROSIS OF THE KIDNEYS

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When anuria or severe oliguria occasionally complicates the immediate puerperium, a serious clinical problem is presented. Eclampsia and the chronic hypertensive type of toxemia in themselves may give rise to oliguria post partum, often because of transient hypotension. Other conditions, the etiology of which is vague, such as bilateral cortical necrosis of the kidney, may also cause grave concern because of suppression of urine post partum. We report a case that resembles bilateral cortical necrosis, recently encountered, in which recovery took place.

REPORT OF CASE

A primipara aged 29, admitted to the Mayo Clinic Dec. 7, 1938, complained of having had slight edema of the face one week before term. Elevation in blood pressure, albuminuria or other evidence of toxemia of pregnancy was not present. December 3 the patient's physician had induced labor with 15 grains (1 Gm.) of quinine and 1 ounce (30 cc.) of castor oil. A normal labor of fourteen hours' duration had ensued but the baby had died in utero soon after pains had begun. After delivery of the child the patient had experienced two severe uterine hemorrhages with hematemesis and the appearance of gross blood in the stool. The uterus was packed, and on the following day two transfusions of 500 cc. each were given. The blood grouping of the patient and donors was type 4 and there was no evidence of incompatibility on cross agglutination. Nausea and vomiting continued. Tubal suction of the Wangenstein type was used.

Almost complete anuria had occurred after delivery, save for a few cubic centimeters of bloody urine. December 6 the pulse had been 80 beats a minute and of good quality. The

11. Snodgrass, W. R.: Observations on the Therapeutic Use of Iodides. *Quart. J. Med.* 4: 247-268 (July) 1935.

12. Katzenstein, Lawrence: Fever Due to Iodides, *Am. J. Syph., Gonorr. & Ven. Dis.* 22: 346-348 (May) 1938.

13. Moore was referring to several of the cases reported in this paper.

14. Hoke, E.: Die Jodprobe: Erhöhte Jodempfindlichkeit der Haut bei Morbus Basedow, Thyreotoxikosen, thyreogen Stigmatisierten, und Symptomatikern, *Med. Klin.* 27: 650 (May 1) 1931.

15. Wolfsohn, G.: Jodallergie bei Thyreotoxie, *Med. Klin.* 27: 1788 (Dec. 4) 1931.

16. Finkelstein, Ruben, and Jacobi, Mendel: Fatal Iodine Poisoning: A Clinicopathologic and Experimental Study, *Ann. Int. Med.* 10: 1283-1296 (March) 1937.

17. Hollander, Lester, and Fetterman, G. H.: Fatal Iododerma: The Eleventh Case Reported in the Literature, *Arch. Dermat. & Syph.* 34: 228 (Aug.) 1936.

18. Mi, C. H., and Yang, C. T.: Iodide Fever, *Chinese M. J.* 32: 887-888 (Dec.) 1937.

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blood pressure had been 120 mm. of mercury systolic, 80 diastolic. The patient was not in any great discomfort and was mentally alert. Edema of the face, grade 3 (on the basis of 1 to 4) with some dependent edema of the back had been evident. The hemoglobin was 42 per cent (Dare); erythrocytes numbered more than 2,000,000 per cubic millimeter. The value for blood urea was 160 mg. per hundred cubic centimeters of blood (LaMotte method). There was no renal pain or tenderness. The patient failed to excrete urine and for that reason was brought to the Mayo Clinic.

Examination at the time of registration revealed that the patient was acutely ill and had a sallow complexion but was mentally clear. Edema of the eyelids and body, grade 3, was present. On ophthalmoscopic examination there was moderate anemia of the disks and choroid; the arteries were dilated. One rather thin petechial hemorrhage with a whitish center was seen in the temporal portion of the right retina. In the left eye there was a small scleral hemorrhage. Physical examination of the heart and lungs gave negative results. The blood pressure was 138/50, the pulse rate was 85 and the temperature was 98.6 F. The abdomen was relaxed and the uterus on palpation extended to the umbilicus. There was ascites, grade 1 (on the basis of 1 to 4). A blood smear at the time of admission showed no evidence of leukemia. The number of platelets was normal and there was very active regeneration of erythrocytes with some normoblasts. The concentration of hemoglobin was 45 per cent (6.8 Gm.). Erythrocytes numbered 3,120,000 and leukocytes 20,200 per cubic millimeter of blood. Chemical examination of the blood gave evidence of 195 mg. of urea per hundred cubic centimeters. The specific gravity of the few cubic centimeters of urine obtained was 1.020; its reaction was acid; albumin grade 3, erythrocytes grade 1 and pus cells grade 2 were present. Casts were not found.

The patient's total urinary output during the first six days after delivery amounted to 570 cc. In all eight specimens albumin was graded 2 or 3, varying from day to day. The number of erythrocytes in the urine also varied with each specimen. The specific gravity became fixed at approximately 1.010. The concentration of blood urea continued to rise, reaching 266 mg. per hundred cubic centimeters and creatinine 12.5 mg. December 14. In spite of the high concentration of urea, only once did the patient complain of being drowsy and this condition was only transitory. December 12 the urinary output was 380 cc.; this increased daily until December 16, when 7,060 cc. of urine was excreted. The urinary output continued to be good and the output exceeded the intake until December 18, when a balance was reached.

Treatment consisted of a low salt diet with 50 Gm. of protein daily. In addition, transfusions of 250 cc. were given December 7 and 8 but were discontinued after this time to obviate the possibility of contributing to the anuria. Fluids were maintained at 3,000 cc. daily. These were given parenterally because of persistent nausea. The solutions used consisted of 10 per cent dextrose in distilled water together with 10 cc. of aminophylline for each thousand cubic centimeters of dextrose. Five hundred cc. of a 5 per cent solution of sodium bicarbonate was given intravenously and 10 grains (0.65 Gm.) of sodium bicarbonate was given three times a day by mouth. Hot wet packs were applied over the renal areas for two days but were discontinued because of the discomfort which they caused the patient. December 9 both ureters were catheterized to make sure that bilateral obstruction of the ureters had not been caused by clotted blood but the ureters were found to be patent. An indwelling urethral catheter was allowed to remain in the bladder for drainage.

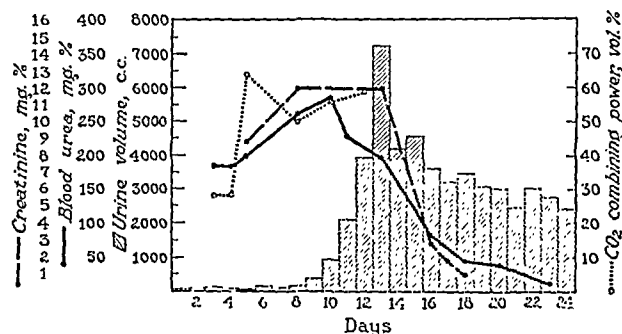
The patient's condition continued to improve under this management and she was dismissed from the hospital December 29, twenty-two days after admission. The physical examination at that time gave essentially negative results, save for breakdown of the episiotomy wound and subinvolution of the uterus, grade 3. The blood urea had returned to normal and the urine was normal save for low specific gravity of 1.009, with albumin grade 1, an occasional erythrocyte, and pus grade 3 due to infection with *Streptococcus faecalis* which developed subsequent to use of the indwelling catheter.

The patient returned to the clinic March 14, 1939, in excellent health. The results of general physical examination were normal. The urine was also normal and the concentration of blood urea was 32 mg. per hundred cubic centimeters. The patient was seen again in July and stated that she was feeling in perfect health. Physical and laboratory examination gave normal results at this time.

COMMENT

From the obstetric point of view this case is typical both of fatal and of nonfatal bilateral cortical necrosis of the kidney in pregnancy. The following features of our case, which were usually observed in the cases reported in the literature, are as follows: (1) fetal death apparently from abruptio placentae as evidenced by the mild toxemia and severe postpartum hemorrhage from uterine atony, (2) typical anuria nearly complete for eight days, (3) clear mental condition of the patient and freedom from symptoms, except nausea and vomiting, in spite of marked nitrogen retention, (4) usual observations in the blood and urine and (5) lack of any urologic lesion to explain the anuria or tangible toxemia other than the factor of pregnancy.

The blood chemistry and other laboratory observations were followed daily and present the interesting facts recorded in the chart. Two of these are of special



Urinary output and changes in blood chemistry.

note. The concentration of creatinine in the blood was higher than that of any hitherto reported case of cortical necrosis of the kidneys (12.6 mg.). The large number of leukocytes, persistent throughout the phase of oliguria, varied from 20,000 to 27,000 per cubic millimeter and may be a manifestation of the toxicity of this condition.

The renal lesion in cases of anuria is often one of tubular disease and of obstruction by hemolyzed blood, a situation similar to that sometimes encountered after the administration of incompatible blood. The role of quinine given to induce labor in this case cannot be overlooked and one may speculate on it for several reasons. It is well known that quinine, even in small doses, may cause hemolysis of the blood in rare instances and that this tendency is increased in pregnancy, especially among those patients who have a pre-eclamptic or eclamptic tendency (Terplan and Javert¹). Terplan and Javert reported a fatal case of hemoglobinuria with oliguria and uremia from quinine in early pregnancy and added similar cases found in the literature.

It is possible that quinine may be the etiologic agent in some cases of bilateral cortical necrosis of the kidneys. The fetal death in such cases (and in ours) is

1. Terplan, K. L., and Javert, C. T.: Fatal Hemoglobinuria with Uremia from Quinine in Early Pregnancy, *J. A. M. A.* **106**: 529-532 (Feb. 15) 1936.

similar to that ascribed to quinine by King,² Gellhorn,³ McSwiney,⁴ Sadler, Dilling and Gemmell⁵ and others. Our patient, strangely enough without mention or suggestion from us, stated that she had felt that the quinine was responsible for her illness. She based this assumption largely on the fact that she vividly recalled a pain over the renal areas of some years ago after ingestion of quinine. The pain lasted several hours and was similar to that experienced in her recent illness.

Because of independability and inefficiency as to oxytocic properties, as well as because of rare deleterious effects to the fetus and mother, quinine has not been used for induction of labor in the Section on Obstetrics in the Mayo Clinic for the past ten years.

Ash,⁶ Gibberd⁷ and others feel that to base a diagnosis of cortical necrosis of the kidneys on gross and microscopic observations is too severe a criterion for diagnosis and that cases of recovery will not be observed except when biopsy of a kidney is performed when the kidneys are decapsulated therapeutically. This may lead to an erroneous conclusion as to the value of decapsulation. The necrosis is not the disease but only one of its prominent characteristics. The etiology is unknown but it may be that an acute infection accompanied by acute nephritis plays such a role. Ash has advanced the term "angioneurotic anuria" to describe more aptly the syndrome; this implies that there is severe local angiospasm in the kidneys. Clinical recovery from cortical necrosis of the kidneys has been reported which could not be distinguished readily from those cases in which death occurred and in which the characteristic lesion was present. In respect to the degree and duration of anuria, the great retention of nitrogen and other such pertinent features, our patient's illness was as typical and as severe as that in most of the cases in which necropsy has confirmed the diagnosis as of true cortical necrosis. With regard to many diseases which depend, for recognition clinically, on even more vague clinical observations than does true renal cortical necrosis, it is not customary to insist that a pathologic diagnosis be made before a clinical one is accepted. It seems that the clinical syndrome of renal cortical necrosis is distinct enough to warrant a presumptive clinical diagnosis. A parturient woman who has an abortion or who gives birth to a dead fetus at a time when signs of toxemia and abruptio placentae are present, and who then experiences anuria or severe oliguria with nitrogen retention in the absence of a urologic lesion, probably has renal cortical necrosis. Convulsions, coma, diarrhea, vomiting and hypertension may or may not be present.

Ash in 1933 reviewed the literature of proved and reasonably presumptive cases of symmetrical cortical necrosis of the kidneys and added two cases of his own. Including his series and those in the literature since his report, we find seventy-four such cases, to which we add our own, making a total of seventy-five. Fifty-three of these patients were pregnant and only one gave birth to a live fetus (twins). Twelve individuals recov-

ered and all but one of these were pregnant. Five of the twelve recoveries were in the last thirteen cases reported since 1933; possibly this indicates the value of recent therapeutic advances.

TREATMENT AND PROGNOSIS

The prognosis in this rare condition is grave; in sixty-three of the seventy-five cases reported to date death has occurred, a mortality of 84 per cent. Many who frequently are called on to treat anuria or severe suppression of urine feel that their efforts are of small avail and that time and degree of renal involvement alone decide the issue of recovery and of death. It cannot be denied that this is true to a large degree and yet we feel that, in borderline cases such as the one which we have reported, various supportive measures may make the difference between recovery and death. We should persist therefore in therapy in spite of discouraging progress.

We feel that these patients should be treated in the same manner as any patient who has acute nephritis with oliguria. It is important to keep the patient warm; hot packs applied over the renal areas, if tolerated, are advisable. Even though edema is present, we feel that fluids should be administered liberally. Usually nausea and vomiting are complicating factors and it is necessary to give fluid intravenously. We prefer 500 cc. of a 20 per cent solution of dextrose together with 10 cc. of aminophylline or 1,000 cc. of 10 per cent dextrose with 10 cc. of aminophylline given morning and afternoon. The total intake of fluid should be between 2,000 and 3,000 cc. a day. Studies of the carbon dioxide combining power, blood urea, creatinine and chlorides should be done. There is a tendency in these cases toward acidosis, which in turn impairs renal function. If the carbon dioxide combining power falls to 40 per cent or less, the administration of 500 cc. of a 5 per cent solution of sodium bicarbonate intravenously is advisable and should be repeated daily until the carbon dioxide combining power is elevated to 50 or 60 volumes per cent. Once this level is reached, it usually can be maintained by the administration of 10 grains (0.65 Gm.) of sodium bicarbonate three times a day by mouth. If hemolysis is present, hematin is precipitated in the tubules of the kidney in an acid medium. Hematin is soluble in an alkaline medium and thus may be dissolved to restore tubular function and urinary excretion.

The patient should be given a diet low in salt and condiments. We prefer to limit the intake of protein to 40 or 50 Gm. a day. We do not feel that the use of diuretics such as potassium nitrate, ammonium chloride or ammonium nitrate is advisable until diuresis has begun, and even then such compounds are of questionable value. Once this type of kidney begins to function, the prognosis is good. Often in such instances credit is given the diuretic agent when really the natural processes of recovery of the kidney have accounted for the improvement. Certainly the more powerful mercurial diuretics are contraindicated and could well destroy all recovery that is taking place. If the patient has become very anemic, transfusions may be tried. However, they should be given in small amounts and cross agglutination of the donor's blood directly with that of the recipient should be performed. Usually the serum protein is normal in these cases. However, it is conceivable that enough blood could be lost through hemorrhage to lower the concentration of protein in the serum to 5 per cent or less, resulting in a decreased

2. King, E. L.: Does Quinine in the Induction of Labor Have a Deleterious Effect on the Fetus? *J. A. M. A.* 101: 1145-1148 (Oct. 7) 1933.

3. Gellhorn, George: Can Quinine Kill the Fetus in Utero? *Am. J. Obst. & Gynec.* 13: 779 (June) 1927, quoted by King.²

4. McSwiney, S. A.: Is Quinine Induction of Labor Absolutely Harmless? *J. Obst. & Gynec. Brit. Emp.* 36: 90-91, 1929.

5. Sadler, Eileen S.; Dilling, W. J., and Gemmell, A. A.: Further Investigations into the Death of the Child Following Induction of Labor by Means of Quinine. *J. Obst. & Gynec. Brit. Emp.* 37: 529-546, 1930.

6. Ash, J. E.: Bilateral Cortical Necrosis of the Kidneys (Angioneurotic Anuria). *Am. J. M. Sc.* 193: 71-86 (Jan.) 1933.

7. Gibberd, G. F.: Symmetrical Cortical Necrosis of the Kidneys: The Importance of Clinical Diagnosis, with an Account of Two Cases of Recovery Under Medical Treatment. *J. Obst. & Gynec. Brit. Emp.* 42: 60-73 (Feb.) 1936.

colloidal osmotic pressure, which would produce further retention of fluid, oliguria and edema. If the concentration of serum proteins is less than 5 per cent and if it is found that a low colloidal osmotic pressure is a factor in inhibiting urinary output, a solution of acacia may be given intravenously. Five hundred cc. of a 6 per cent solution of acacia can be given daily or on alternate days until 1,500 cc. (a total of 90 Gm. of acacia) has been given. In this particular case we did not feel that a low colloidal osmotic pressure was a factor and therefore acacia was not given.

Decapsulation was considered but the procedure was dismissed as being too hazardous and as offering too slight an advantage to be attempted. It was felt that added trauma, anesthetic agents and other factors would do more harm than good. We feel that if the toxic or infectious process in the kidneys is not too overwhelming and if the patient has the natural vitality to stand the accompanying uremic condition until the acute process in the kidneys subsides, with modern physiologic aids these patients have the best chance of recovery. We further believe that it is very important to keep the patient free of acidosis, to supply fluids liberally but not in excessive amounts, to administer mild diuretics such as dextrose with aminophylline intravenously as gentle stimulants to diuresis, to avoid in the dietary regimen placing any unnecessary burden on the kidneys such as using salt, condiments and excessive amounts of proteins and to avoid dangerously irritating diuretics.

STRICTURE OF RECTUM SECONDARY TO LYMPHOGRANULOMA VENEREUM

TREATMENT WITH DIATHERMY

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In the past few years a voluminous literature has appeared on the subject of stricture of the rectum secondary to lymphogranuloma venereum. Almost without exception, however, the treatment of this condition has been dealt with superficially and briefly. The obvious reason for this has been the inadequacy of all forms of treatment instituted. An utter feeling of despair has arisen in both patient and physician, so that permanent colostomy has been accepted as the procedure of choice. What a high price this is for the young adult afflicted with an otherwise benign condition that can be reached with the finger! And no hope was entertained by these patients of ever having these colostomies closed after any local form of treatment to the strictured areas. Ault¹ in his review of venereal diseases of the rectum states that "No permanent cure of stricture due to lymphogranuloma venereum has been reported to date."

In treating a patient with an almost complete stricture of the rectum, for which a colostomy was performed two years previously, one of us (H. M.) came upon a form of treatment which was found quite satisfactory in curing these strictures. While no priority in the use of this form of treatment is claimed, since it

was suggested in 1925 by Picard² for so-called benign strictures of the rectum, its use is here reported in a small number of cases of stricture secondary to lymphogranuloma venereum with complete cure. This preliminary report is offered in the hope of having this treatment more extensively used, in an effort to save these patients from a permanent colostomy.

A few words regarding the etiology of this condition may lead to a better understanding of its clinical manifestations. Like syphilis, lymphogranuloma venereum has an early primary and a late secondary lesion. The first stage is an evanescent painless lesion, consisting of a herpetiform vesicle lasting a few days. Following this lesion and depending on its location, there arise the various manifestations of the condition according to the lymphatic drainage from the particular area involved. Should the lesion occur on the external genitalia in either sex, the lymphatic glands of the groin, which drain these areas, become directly involved (fig. 1).

When the primary lesion is implanted on the posterior vaginal wall or on the cervix, the virus is permitted to drain not to the inguinal glands, where it would be relatively benign, but to the posterior lymphatics lying in the uterosacral ligaments, which skirt each side of the lateral walls of the rectum, as Nesselrod³ has shown (fig. 2). Here they anastomose with and invade the rectal lymphatics, where an extensive perirectal fibrosis is produced, which is the underlying factor in the stenosis. By reason of this more common implantation in the female, buboes are relatively rare and stricture of the rectum is more frequent.⁴ In the male, however, the primary lesion commonly occurs on the surface of the glans or in the anterior urethra, both areas of which drain to the groin. This accounts for the more frequent occurrence of buboes in the male. There being no connecting lymphatics between the glands in the groin and those about the rectum, stricture in the male could not arise by any such spread. In the male a history is usually obtained of direct implantation of the virus in the rectal mucosa by sodomy and is accompanied with an ulcerative proctitis. Bensaude and Lambling⁵ state that a previous history of this was obtained in 80 per cent of seventy cases of stricture in the male. Sodomy was admitted by two of our male patients. Following this proctitis, which is usually associated with a sanguinopurulent discharge, there results a stenosing fibrosis, leading eventually to a complete stricture.

There are, however, two other possible explanations for the occurrence of the condition in the male. If the infection should spread from a primary lesion in the anterior urethra to the posterior urethra, drainage to the perirectal lymphatics can occur. The drainage from the posterior urethra is similar to that from the prostate gland, and, since the prostatic utricle is embryologically homologous with the uterus, its lymphatic drainage is the same (fig. 3). The virus is therefore carried from the posterior urethra directly back to the perirectal lymphatics, where it produces periadenitis and subsequent perirectal fibrosis. Another possible explanation for the production of rectal stricture in either sex is the development of a primary anal

2. Picard, H.: Treatment of Stricture of the Rectum by Diathermy, *Zentralbl. f. Chir.* 52: 1709 (Aug. 1) 1925.

3. Nesselrod, J. P.: The Genito-Anorectal Lymphatics: A Restudy Relative to Lymphopathia Venereum, *Proc. Staff Meet., Mayo Clin.* 11: 369 (June 10) 1936.

4. Stannus, H. S.: A Sixth Venereal Disease, London, Baillière, Tindall & Cox, 1933.

5. Bensaude, R., and Lambling, A.: Discussion on the Etiology and Treatment of Fibrous Stricture of the Rectum (Including Lymphogranuloma Inguinale), *Proc. Roy. Soc. Med.* 29: 1441 (Sept.) 1936.

From the Surgical Service of Cumberland Hospital, Dr. Merrill N. Foote, director.

1. Ault, G. W.: Venereal Diseases of the Anus and Rectum, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 430 (July) 1937.

lesion with spread of the infection upward to the rectal lymphatics, through the columns of Morgagni (fig. 1).

The great variety of treatments offered for this condition leads one to conclude that there is no one really effective cure. The proctitis, which may precede the stenosis in the male or be associated with the stenosis in both the male and female later in the disease, with secondary fistulas and ulcerations of the mucous membrane, may be remarkably affected by antimony and potassium tartrate, fuadin, sulfanilamide or Frei antigen. This we have found to our satisfaction, as have others (Bloom,⁶ Bensaude and Lambing⁷ and Shropshear⁸). The pain in the rectum disappears, as do the purulent discharge and tenesmus. But in the cure of the stricture the results with these chemotherapeutic agents have been uniformly discouraging. One would hardly expect the dense fibrous stricture to yield to any form of parenteral injection therapy.

As regards surgical intervention, apart from colostomy little hope can be held out for it in the cure of these patients, for in nearly all cases there is a recurrence of the stricture.⁹ Colostomy, when used for the relief of a complete obstruction, has its place in the

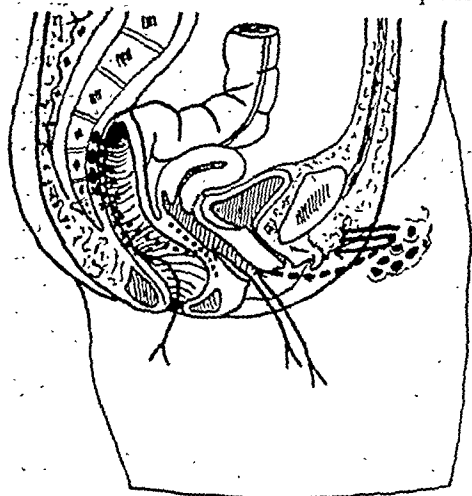


Fig. 1.—Schème showing the methods of penetration of the virus of Nicolas and Favre. The crosses represent direct intrarectal inoculation leading to the glands of Gerota, the dots inoculation into the posterior vaginal wall leading to the same glands through the rectovaginal septum, the dashes inoculation into the anterior vaginal wall and into the external genital organs leading to the inguinal region with lymphatic stasis.

care of the emergent symptoms of the far advanced stage. But as a form of treatment, with or without abdominoperineal resection of the rectum, it is far from adequate or satisfactory, for it leaves these young victims with the care of a permanent fecal fistula. Even as a preliminary to other forms of treatment for the stricture, with the hope of subsequently closing the colostomy, it is of no avail. Lazzari⁹ did this in nine cases and could subsequently close but one.

We suggest a form of treatment which in our hands has been quite successful in the cure of these patients with stricture of the rectum, namely diathermy. This method is here emphasized because of its infrequent use in clinics in this country. Picard,² whose report appeared in 1923, was apparently the first to apply this form of treatment to fourteen cases of benign stricture of the rectum, with complete cure after a three year follow-up

study. In December 1925 Bensaude and Marchand¹⁰ reported on the use of diathermy with excellent results, after having tried a number of other procedures for these strictures. They, however, did not report its use in any cases in which a colostomy was performed previously but stated that with this treatment the necessity for a colostomy is avoided. In February 1937, however, D'Allaines and Hillemand¹¹ reported the cure of a lymphogranulomatous stricture of the rectum in a patient who had had a colostomy performed for complete intestinal obstruction, by forty applications of diathermy in association with intravenous injections of sodium salicylate. The stricture melted away and the colostomy was subsequently closed. This is the only report of cure with diathermy in this type of case. One of us (H. M.) tried it in three such cases with complete success and subsequent closure of the colostomy.

Many of these patients had had other forms of treatment previously, such as administration of fuadin, antimony and potassium tartrate and Frei antigen injections, without any effect on the stricture. Following these forms of treatment, diathermy, in association with subcutaneous injections of Frei antigen, was given.¹² The first patient so treated, was given other forms of treatment at the same time, but in view of their known inefficacy it was believed that the diathermy was the effective agent. This, in association with Frei antigen injections, was therefore used in subsequent cases.

The diathermy machine used was of the old long wave type. One pole consisted of a metal plate applied to the lower part of the abdomen, and the other was a metal Hegar dilator which was inserted into the rectum. Increasingly larger sizes of dilators were used as the strictured area increased in caliber and were inserted without pain or any intention of mechanically dilating the stricture. The largest metal dilator that could be comfortably inserted was used. Treatments were given twice a week for twenty minutes each. The patient's tolerance to the diathermy was gradually increased by first using 900 milliamperes of current and then gradually increasing to a maximum of 1,800 milliamperes. Once a week during the period of treatment 0.1 cc. of Lederle mouse brain Frei antigen was injected subcutaneously. It was found that this combined therapy of Frei antigen plus diathermy produced a more rapid dissolution of the stricture than the diathermy alone.

REPORT OF CASES

CASE 1.—M. C., a man aged 28, a Puerto Rican, was admitted to the Cumberland Hospital Oct. 18, 1936, having noticed a gradual onset of increasing constipation with the passage of ribbon-like stools and occasionally blood and pus by rectum, beginning in 1932. Nov. 1, 1934, approximately two years before this admission, he was admitted to the Marine Hospital, Staten Island, N. Y., for the same complaints as well as pain in the rectum, tenesmus and bleeding at defecation. At the Marine Hospital a stricture of the rectum, the opening of which was narrowed to 1 cm. in diameter, was noted 8 cm. above the anal orifice. Dec. 5, 1934, colostomy on the left was performed for the relief of these symptoms. He was discharged from the Marine Hospital Sept. 16, 1935, with a well functioning colostomy and with a slight amount of fecal drainage from the rectum.

On admission to the Cumberland Hospital examination revealed the colostomy on the left and an almost complete

6. Bloom, David: Lymphogranuloma Venereum, New York State J. Med. 38: 616 (April 15) 1938.

7. Shropshear, George: Sulfanilamide in the Treatment of Stricture of the Rectum Caused by Lymphogranuloma Venereum: Preliminary Report, Illinois M. J. 74: 153 (Aug.) 1938.

8. Procès verb. et mém. Cong. franç. de chir. 42, Paris, Oct. 8, 1934.

9. Lazzari, J. H.: The Anorectal Syndrome of Lymphogranuloma, Ann. J. Surg. 34: 316 (Nov.) 1936.

10. Bensaude, R., and Marchand, J. H.: A Particularly Effective Treatment of Inflammatory Stricture of the Rectum, Presse méd. 33: 1539 (Dec. 2) 1925.

11. D'Allaines, F., and Hillemand, P.: Rétrécissement inflammatoire du rectum guéri par l'injection de fuadine, Arch. d. mal. de l'app. digestif 27: 202 (Feb.) 1937.

12. Dr. Henry Cadan, in charge of the physical therapy department at the Cumberland Hospital, and Mr. Rees, physical therapist, assisted in the treatment.

stricture of the rectum $3\frac{1}{2}$ inches (8 cm.) above the anal orifice. The strictured area permitted, at most, the introduction of a fine catheter. Laboratory examinations yielded negative spinal and blood Wassermann reactions, negative gonococcus complement fixation but a strongly positive Frei skin test. X-ray examination by means of barium sulfate instilled into the distal

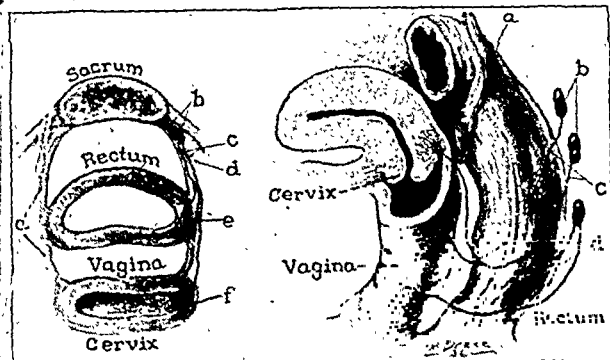


Fig. 2.—Left: arrangement of lymphatic structures in the female; a, sacrorectogenital aponeurosis; b, lateral sacral nodes; c, collecting trunks; d, rectal stalk; e, rectal plexus of origin; f, vaginal or cervical plexus of origin. Right: a, peritoneal reflection; b, lateral sacral nodes; c, collecting trunks; d, plexuses of origin (from Buie's Proctology).

loop through the colostomy opening revealed a pinhead stricture of the ampulla of the rectum for a distance of about 1 inch (2.5 cm.; fig. 4).

November 9, about three weeks after admission, a course of fourteen injections of antimony and potassium tartrate and fuadin was started. No evident improvement was noted in the size of the stricture. Subsequently, therefore, metal Hegar dilators were passed through the strictured area with some difficulty, beginning with a 5 mm. dilator, and the diathermy treatments were started. The metallic dilators were gradually increased in size as the diameter of the lumen increased until a 24 mm. dilator was used. During this time the patient was also given 0.1 cc. of Frei mouse brain antigen subcutaneously, twice weekly. After having received a total of seventy-six injections of this Frei antigen subcutaneously and a total of ninety-four diathermy treatments, the patient's condition improved markedly and the rectum returned to normal caliber. Oct. 11, 1937, therefore, the colostomy was closed. The patient did well postoperatively and was discharged October 25. At this time he was having bowel movements regularly by rectum, with no more drainage from the site of the previously existing colostomy. He subsequently received no further diathermy treatments to the rectum.

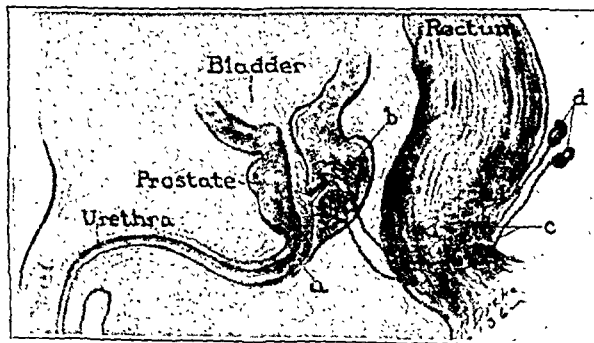


Fig. 3.—Arrangement of lymphatic structures in the male: a, urethral plexus of origin; b, prostatic plexus of origin; c, collecting trunks; d, lateral sacral nodes (from Buie's Proctology).

He was given a follow-up examination Dec. 21, 1938, more than one year later. At this time he was feeling fine and having regular bowel movements without use of cathartics. The colostomy wound was entirely closed. Rectal digital examination revealed an entirely normal rectal mucosa, without any evidence of a previously existing stricture. Barium sulfate enema examination at this time revealed a most marked increase

in the caliber of the lumen of the bowel (fig. 5). This is in marked contrast to the previously existing pinpoint opening prior to the institution of treatment (fig. 4).

CASE 2.—D. W., a white man aged 45, was admitted to the Cumberland Hospital March 15, 1936, with the complaints of a purulent discharge and pain in the rectum of six months' duration. A hemorrhoidectomy and fistulectomy had been performed six months previously for the same complaints. Rectal examination on admission revealed a tender mass 1 inch from the anal orifice, which bled easily, and a circular stricture of the rectum at this location. A Frei skin test was positive, and a blood Wassermann reaction was negative. A biopsy of the mass was performed, and the growth was reported as a granuloma. The patient was given nine intramuscular injections of fuadin and was discharged from the hospital with the stricture unimproved. Subsequently he was observed in the outpatient department, where he was given forty-two intravenous injections of antimony and potassium tartrate and nine additional intramuscular injections of fuadin, without any benefit. Frei skin tests were repeatedly positive.

On examination June 2, 1938, he still complained of a purulent discharge from the rectum and marked difficulty in defecation. At this time he was found to have a marked stricture of the

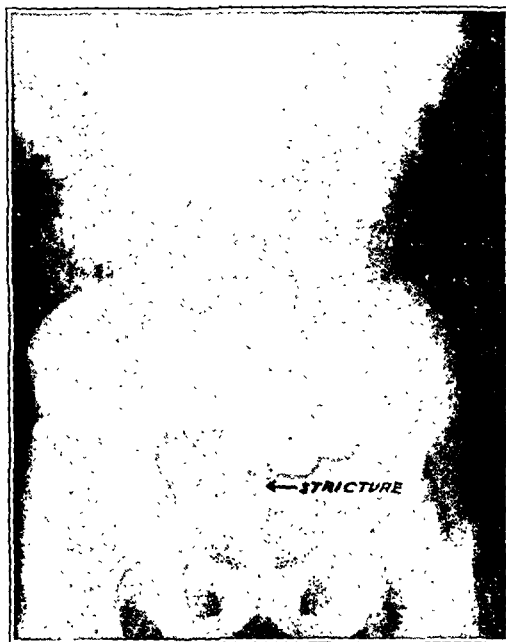


Fig. 4 (case 1).—Extent of stricture of rectum before treatment.

rectum which would not admit the introduction of the tip of a finger. Diathermy treatments, beginning with a 10 mm. Hegar dilator and subcutaneous injections of 0.1 cc. of Frei antigen were started.

He was last seen in June 1939, after having had 103 diathermy treatments and fifty subcutaneous injections of 0.1 cc. of Frei antigen. At this time the stricture was found to have completely resolved, and the rectum permitted the introduction of the finger or a 26 mm. Hegar dilator with ease. The patient was having regular bowel movements without any discomfort, no longer had any rectal discharge and felt much improved for the first time.

CASE 3.—J. B., a Negro woman aged 30, was admitted to the Cumberland Hospital Oct. 19, 1938, with swelling of the perineum, which had increased for the past five years. She also had become markedly constipated and was passing pencil size stools and blood by rectum during this period. Physical examination on admission revealed a marked hypertrophic elongation of the left labium minus about 5 inches (13 cm.) long and containing several discharging fenestrations. Digital rectal examination revealed the presence of a marked stricture of the rectum, which barely admitted the introduction of the little finger 1 inch from the anal orifice. The blood Wasser-

mann reaction was negative, but a Frei skin test was positive. The erythrocyte sedimentation rate was ten minutes for 24 mm. A barium sulfate enema examination revealed a marked stricture of the lower third of the rectum over a distance of about 2 inches (5 cm.); figure 6.

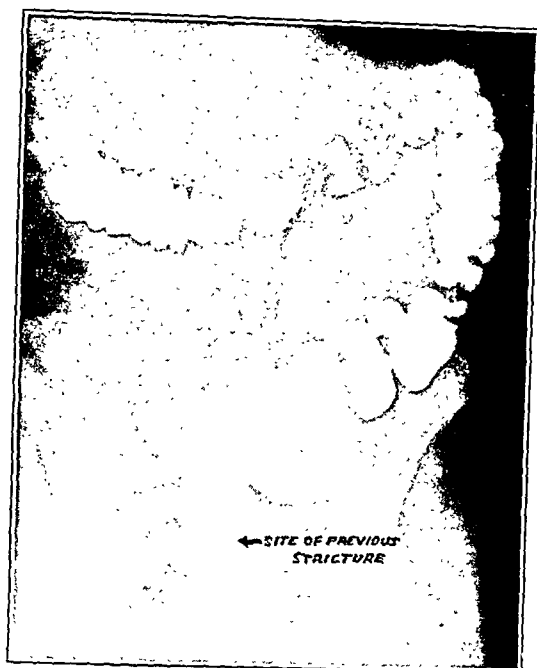


Fig. 5 (case 1).—Appearance of rectum after treatment.

Because of the inconvenience of the discharging redundant tissue, the hypertrophied left labium minus was resected. Pathologic examination revealed it to be a papilloma with chronic inflammation. Because of the marked rectal stricture,



Fig. 6 (case 3).—Extent of stricture of rectum before treatment.

November 19, diathermy treatments were started, beginning with a 12 mm. Hegar dilator. She was then discharged to the clinic for further treatment. Subsequently, she received a total of forty-two such treatments and twenty-one injections of Frei antigen. After this she felt much improved and was able to have normal size bowel movements with ease, without pain or bleeding.

On follow-up examination April 8, 1939, she was found to have a completely normal, smooth rectal lumen at the site of the previously existing nodular stricture, which now easily permitted the introduction of the whole finger or a 26 mm. Hegar dilator. Barium sulfate enema roentgenograms taken at this time revealed a most marked alteration in the caliber of the bowel lumen (fig. 7).

CASE 4.—J. F., a white man aged 44, was first admitted to the Cumberland Hospital Jan. 21, 1936, having noted increasing difficulty in moving the bowels for the past three years. He attributed this complaint to a fistulectomy and hemorrhoidectomy performed three years previously at another hospital. Examination on admission revealed a rectal stricture 5 cm. from the anal orifice which just about permitted the introduction of the finger or a No. 18 sound. He was discharged from the hospital unimproved after a single manual dilation. A Frei skin test was not done at this time. The blood Wassermann reaction, however, was negative.

He was seen again Feb. 5, 1938, at which time he was having the same complaints. On examination, a marked rectal stricture was found which would admit the introduction of a 10 mm.



Fig. 7 (case 3).—Appearance of rectum after treatment.

Hegar dilator. A Frei skin test was now positive. At this time diathermy treatments to the rectum and Frei antigen injections were started.

On follow-up examination Jan. 4, 1939, after a total of fifty-one diathermy treatments and twenty-five Frei antigen injections, the stricture was found to have completely resolved. The rectum could now admit a 26 mm. Hegar dilator without any pain or discomfort. He was having bowel movements by rectum without the use of cathartics and was feeling fine. Treatments were therefore discontinued. He was last seen October 20, at which time he had no complaints and examination failed to reveal any sign of previously existing stricture and nodulations.

CASE 5.—M. S., a Negro woman aged 44, was first admitted to the Cumberland Hospital Dec. 1, 1935, with markedly increasing constipation and the passage of ribbon-like stools and occasionally blood from the rectum, of three years' duration. Examination at this time revealed numerous perianal fistulas and a stricture of the rectum 1 inch from the anal orifice which was unable to admit a pencil. Purulent material was seen exuding from the several openings about the anus. A Frei skin test was positive and the blood Wassermann reaction was negative. The patient was subjected to a fistulectomy and manual rectal dilation under anesthesia and was discharged from the hospital improved.

One and a half years later she was seen in the outpatient department, with the same complaints and with the previously existing marked rectal stricture. She was given nine intramuscular injections of 5 cc. of fuadin without any relief.

April 24, 1938, she was readmitted to the hospital with the complaint of marked tenesmus and the passage of stringlike stools. At this time she had a stricture of the rectum which barely admitted the tip of the small finger. A Frei skin test was again strongly positive. May 3 colostomy on the left was performed for the relief of her obstructive symptoms. Subsequently, during her stay in the hospital, diathermy treatments, starting with an 8 mm. Hegar dilator, and Frei antigen injections were given. After eight treatments she was discharged, much improved, August 5, at which time she was having bowel movements by rectum and her stricture was found to admit a finger with ease. She had a slight amount of fecal drainage from her colostomy wound at this time.

Subsequent to discharge from the hospital she received twenty additional diathermy treatments and ten subcutaneous injections of 0.1 cc. of Frei antigen. Follow-up examination of the rectum October 5 revealed the stricture to have resolved, and the area admitted a 26 mm. Hegar dilator with ease. The patient felt fine, had no drainage from her colostomy opening and was having bowel movements by rectum without the use of a cathartic. She was advised readmission to the hospital for the closure of the colostomy, which was performed on Jan. 19, 1939. She was discharged February 26, having normal bowel movements and no further fecal drainage from the site of the previous colostomy opening. She subsequently received twenty diathermy treatments and ten injections of Frei antigen, after which her rectum no longer had the marked nodulations, was of normal caliber and easily permitted the introduction of the finger.

118 Eighth Avenue.

ERYSIPELOTHRIX ENDOCARDITIS: A COMPLICATION OF ERYSIPELOID

REPORT OF A CASE WITH NECROPSY

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ST. LOUIS

AND

MARION E. LAMB

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"Erysipeloid" is the term first applied by Rosenbach¹ in 1884 to a self-limited skin infection characterized by a slowly progressive, painful erythema beginning at the site of infection and extending peripherally as the central area fades. He observed this infection on the hands of kitchen workers, butchers and those who handle fish and game. This disease is now known to be caused by *Erysipelothrix rhusiopathiae*, the organism of swine erysipelas, and is identical with the cutaneous infection generally known to the public as "fish poisoning" acquired from handling either fresh or salt water fish. Its recognition as a significant occupational disease of commercial fishermen, abattoir workers (Klauder, 1938²) and bone button cutters³ has been reported.

A case of bacterial endocarditis caused by *Erysipelothrix rhusiopathiae* is reported because it is a rare fatal complication of erysipeloid infection and no similar bac-

teriologically proved case has been found in the literature. Attention will be called to a similar form of *Erysipelothrix* infection with bacterial endocarditis seen in swine complicating swine erysipelas.

REPORT OF CASE

Clinical History.—R. D., a white man aged 37, American, married, a lobster fisherman, entered the hospital Oct. 1, 1938, complaining of continuous pain in the right leg of four days' duration. For two months before admission there had been progressive weakness, malaise, occasional chilly sensations and a loss of 20 pounds (9 Kg.) in weight. One month before entry a nonsuppurative ulceration, approximately 1 cm. in diameter, appeared on the upper lip accompanied by moderate swelling and erythema. It healed in one week with sulfur ointment therapy. There had been no other cutaneous lesions.

Twenty years previously (in 1918) the patient was in the army enlistment, being told that he had rheumatic heart disease. Cardiac symptoms had never been noted. He had led an active life including some manual labor. No migratory pains of the joints or involuntary movements suggestive of chorea were recalled. In the right shoulder there had been periodic stiffness with pain for the past four years. Other symptoms referable to the joints were not noted.

Large quantities of hard liquor had been consumed for many years, indulgence being excessive for the two months preceding entry to the hospital. His first employment as a lobster fisherman, which necessitated the manual handling of large quantities of live lobsters, occurred four months before admission. Injuries or infections of the hands during this time were not mentioned in the history and were not known to the patient's family according to information given after death.

Physical Examination.—The patient was well developed but poorly nourished; he was acutely distressed with pain in the right lower leg, made worse by movement. The right foot including the lower third of the tibia, was cold and blanched. The right dorsalis pedis pulse was easily felt, but the right posterior tibial pulse was just perceptible. A dry warm skin was noted, but no excoriations, scars or areas of erythema. The heart was enlarged to percussion with the left border dullness 9 cm. from the midsternal line in the sixth interspace. Supracardiac dullness measured 7.5 cm. The heart sounds were distant and of poor quality with the pulmonic second sound louder than the aortic. A systolic thrill was felt in the aortic area. There was a precordial systolic murmur heard loudest at the base and transmitted to the vessels of the neck. A long blowing diastolic murmur was heard at the apex. The pulse was full, bounding and of the Corrigan type. Small non-tender lymph nodes were palpated in the right axilla and both groins. Slight clubbing of the fingers was noted.

The blood pressure was 120 mm. of mercury systolic and 40 mm. diastolic, the pulse rate 100, the temperature 101.5 F. and the respiratory rate 25 per minute.

Laboratory Examination.—Three urine examinations showed a few white blood cells and on one occasion a few red blood cells but never any albumin or casts. On admission the erythrocyte count was 3,800,000 and the hemoglobin content 70 per cent. The erythrocyte level fell steadily to 2,000,000 and the hemoglobin to 40 per cent two days before death. The white blood cells fluctuated between 9,200 and 6,400. On admission the differential count was 72 per cent neutrophils, 10 per cent lymphocytes, 2 per cent eosinophils and 16 per cent monocytes. A note concerning the smear said that the monocytes appeared vacuolated. The next smear, taken eight days later, after subsequent examinations showed a normal distribution of cells, the highest monocyte percentage being 4. A blood Hinton test was negative. The nonprotein nitrogen content of the blood was 24 mg. per hundred cubic centimeters. The icteric index taken the day of death was 15. Six blood cultures all showed a small, slender, straight or slightly curved gram-positive bacillus.

Course of Illness.—After three days of local heat therapy the right leg became asymptomatic. The pulse remained elevated, and the temperature spiked between 90 and 103 F. Transfusions, sulfanilamide and ultraviolet therapy had no appreciable effect on a steady downhill course marked by progressive weakness.

From the Mallory Institute of Pathology, Boston City Hospital.
1. Rosenbach, A. J. F.: Mikroorganismen bei den Wundinfektionskrankheiten des Menschen, Wiesbaden, J. F. Bergmann, 1884.

2. Klauder, J. V.: Erysipeloid and Swine Erysipelas in Man: A Clinical and Bacteriologic Review; Swine Erysipelas in the United States, J. A. M. A. 86: 536 (Feb. 20) 1926. Klauder, J. V.; Righter, L. L., and Harkins, M. J.: A Distinctive and Severe Form of Erysipeloid Among Fish Handlers: Report of Clinical and Laboratory Studies; Demonstration of the Bacillus of Swine Erysipelas, Arch. Dermat. & Syph. 14: 662 (Dec.) 1926. Klauder, J. V., and Harkins, M. J.: Erysipeloid in the United States: Clinical and Laboratory Study, J. A. M. A. 96: 1205 (April 11) 1931. Klauder, J. V.: Erysipeloid as an Occupational Disease, ibid. 111: 1345 (Oct. 8) 1938.

3. McGinnes, G. F., and Spindle, Forrest: Erysipeloid Condition Among Workers in Bone Button Factory Due to Bacillus of Swine Erysipelas, Am. J. Pub. Health 24: 32 (Jan.) 1934.

s, anorexia, emaciation and anemia. Petechiae were never observed. Death occurred on the twenty-sixth hospital day.

Clinical Diagnoses.—These were subacute bacterial endocarditis and rheumatic heart disease with mitral and aortic stenosis and insufficiency.

Necropsy.—Necropsy was performed five hours after death. The body was well developed but poorly nourished, with slight pitting edema of both ankles and a slight icteric tint to the scleras. The lungs, gastrointestinal tract, pancreas, kidneys, adrenals bladder, aorta and bone marrow were grossly not remarkable. The significant observations were as follows:

Each pleural cavity contained approximately 1,000 cc. of clear straw-colored fluid. The visceral pericardium was adherent to the parietal pericardium by easily freed fibrinous adhesions. The surfaces were light yellowish pink and were covered with a fine granular deposit of fresh reddish fibrin.

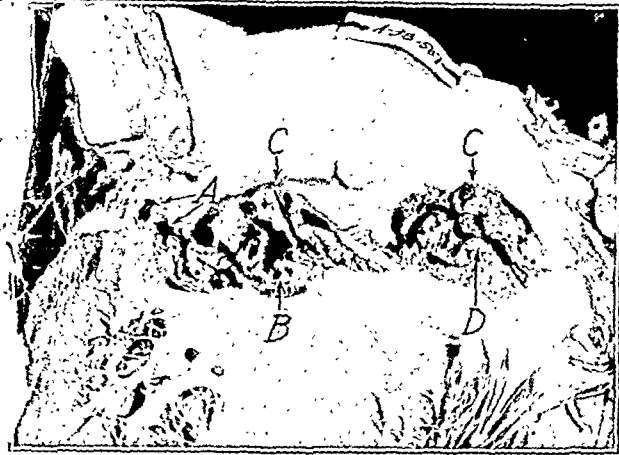


Fig. 1.—Heart showing the aortic valve with bulky vegetations, two abscess cavities in the subepicardial fat and myocardium; B, vegetations invading the mural endocardium; C, bicuspid arrangement of aortic valve, right and left commissures, and D, mycotic aneurysm invading the aortic ring.

The heart was nearly twice normal size, weighing 500 Gm.

small, deep pinkish yellow, finely granular and firmly attached vegetations were seen on the free margin of the anterior leaflet of the mitral valve, the largest measuring 0.5 cm. in diameter. Two of the chordae tendineae had vegetations, each 0.2 cm. in diameter and similar in all respects to those on the mitral valve. The mitral cusps were not thickened or distorted and the chordae tendineae were delicate, thin and breadlike. There appeared to be but two aortic cusps, since only two commissures could be made out. The cusps were largely replaced by fungating, slightly friable and coarsely granular, deep pinkish yellow vegetations reaching a maximal thickness of 1 cm. The right commissure was obscured by vegetations that extended laterally 1 cm. into each aortic sinus. The vegetations were particularly bulky in this area, invading the sinus wall, the ring and the adjoining muscle for a depth of 1 cm. A section through the left aortic sinus, valve cusp and myocardium revealed two small abscess cavities, 0.5 cm. and 0.3 cm. in diameter respectively, containing semifluid, pale, brownish yellow pus. The smaller cavity was in the subepicardial fat and the larger, partly in the myocardium, lay close to the bulky vegetation of the cusp. Adjoining and below the left commissure an area of endocardium measuring 1 by 1 cm. was covered with coarsely granular, pinkish yellow vegetations which were inseparably attached and appeared to necrotize the subjacent myocardium.

The spleen was twice normal size, weighing 400 Gm., and contained a small (4 cm.), moderately firm, fresh infarct covered with a thin layer of yellowish fibrin.

Anatomic Diagnoses: These were subacute bacterial endocarditis of aortic and mitral valves with mycotic aneurysm and abscess formation, bicuspid aortic valve, infarct of spleen, adinous pericarditis and hydrothorax.

Microscopic Observations.—Heart: A section through the aortic ring and adjacent cusp stained by the phloxine-methylene

blue method revealed the cusp markedly thickened with layers of organizing fibrin containing large clumps of blue staining bacilli. Two abscesses containing necrotic material, polymorphonuclear leukocytes and macrophages were present within the adjacent myocardium. Fibrosis was marked around the abscesses. A Gram-Weigert stain of this section revealed gram-positive bacilli scattered singly and in large clusters throughout the vegetation on the cusp. In scattered collections of macrophages the bacilli were heavily phagocytized, outlining the cells as deep blue-black bodies. No bacilli were seen within or surrounding the abscess cavities previously described.

A section of the myocardium showed the pericardial surface covered with a thin layer of fibrin containing neutrophils and macrophages. Several small foci of neutrophils were scattered throughout the myocardium.

Spleen: Approximately one third of the section showed a necrotic infarct which was demarcated from the viable tissue by a broad zone of fibrin and polymorphonuclear leukocytes. The centers of many of the malpighian corpuscles had large deposits of fibrin containing scattered neutrophils. A Gram-Weigert stain of this section revealed no organisms.

Liver: Marked central necrosis of the liver lobules was present with only a peripheral fringe of viable cells.

Kidney: Several glomeruli contained small fibrin thrombi in the capillaries and, in some instances, exudation of fibrin and neutrophils into the glomerular space and adjoining tubules.

Testis: No adult spermatozoa were found. A small arteriole beneath the tunica contained a thrombus of dense fibrin with a growth of endothelium over the surface. One small focal area of neutrophils and fibrin was present.

Microscopic Diagnoses: These were abscesses of the aortic ring with local interstitial myocarditis, and acute focal embolic lesions of the myocardium, kidney (glomeruli) and testis.

Bacteriology: Cultures of the heart's blood and an endocardial vegetation yielded a small, slender, straight or slightly curved gram-positive bacillus. A culture of the pericardium was negative.

BACTERIOLOGY

The organisms grown from the six blood cultures, the heart's blood and the endocardial vegetation were identical morphologically, culturally and serologically with a known strain of *Erysipelothrix rhusiopathiae* that was sent us from the Pathological Division of the Bureau of Animal Industry of the United States Department of Agriculture in Washington, D. C. The following characteristics were observed:

Morphology.—The organism was a small, slender, straight or slightly curved rod, from 1.5 to 1 micron in length and from 0.3 to 0.4 micron in width, arranged singly and in small groups or in chains. It was non-motile and non-spore forming, gram positive and non-acid fast. In old broth cultures and from intermediate rough colonies (described in the following section) from blood agar plates the organism grew in long chains and interlacing filaments of variable length. Some filaments, staining irregularly by the Gram method, appeared somewhat beaded.

Cultural Characteristics.—Good growth on blood, on plain and chocolate agar and on Löffler's blood serum was obtained under both aerobic and anaerobic conditions. Typical smooth colonies appeared after forty-eight hours (at 37 C.) and were round, convex and water clear with slightly undulate edges. They varied from 0.1 to 0.8 mm. in diameter. Typical rough colonies as described by Barber⁴ were never observed. The rough forms noted corresponded to the intermediate rough colonies described by this author. Intermediate rough colonies from old culture transplants were broader and flatter with slightly dentate edges and raised centers. These colonies measured about 0.6 to

4. Barber, Mary: A Comparative Study of *Listeria* and *Erysipelothrix*. *J. Path. & Bact.* 43:11 (Jan.) 1939.

1 mm. in diameter. Further incubation of intermediate rough colonies revealed little change in the size of the colony, but in some instances a low, spreading type of growth extended peripherally for varying distances up to 1.5 mm.

Colonies on blood agar plates were surrounded by a small zone of greenish hemolysis (alpha type), and a somewhat smaller zone of peculiar greenish discoloration was noted on chocolate agar.

In plain, ascitic and blood broth turbidity appeared in twenty-four hours. Smooth forms produced a uniform turbidity with a minimal amount of sediment, while the intermediate rough forms produced a flocculent type of growth with a large amount of sediment.

In gelatin stab cultures, smooth colonies produced a lamp brush type of growth along the stab in one week. Intermediate rough colonies grew more irregularly, with "bursting bomb" figures. No liquefaction was obtained.

Virulence.—The virulence of the organism was studied in mice, guinea pigs and rabbits.

White mice inoculated intraperitoneally with twenty-four hour broth cultures died in from eighteen to twenty-four hours. The organism was regularly seen on direct blood smear and was recovered in pure culture from the peritoneal fluid and the heart's blood. Serial dilutions of twenty-four hour broth cultures were fatal for white mice (observed in two series) up to and through a 1:50,000 dilution (equivalent of 0.00002 cc. of the original twenty-four hour broth culture).

Three guinea pigs survived intraperitoneal injections of 2 cc. of forty-eight hour broth cultures with no demonstrable effect.



Fig. 2.—Gram-Weigert stain of an endocardial vegetation. Bacilli are shown as interlacing filaments. In the lower right corner macrophages are seen with ingested bacilli. Slightly reduced from a photomicrograph with a magnification of 800 diameters.

Three rabbits inoculated intravenously with 2 cc. of a forty-eight hour broth culture all survived. One animal became sick and lost weight but recovered completely in two weeks. The others showed no demonstrable effect.

Serum Reactions.—Two rabbits that had been previously inoculated intravenously with 2 cc. of a forty-

eight hour broth culture were immunized as follows. Injections of 0.5, 1, 2 and 4 cc. of forty-eight hour broth cultures of our organism were given intravenously at four day intervals. A third rabbit was immunized by the same procedure with the known strain of *Erysipelothrix rhusiopathiae*. Serum from the rabbit immunized with our organism agglutinated known

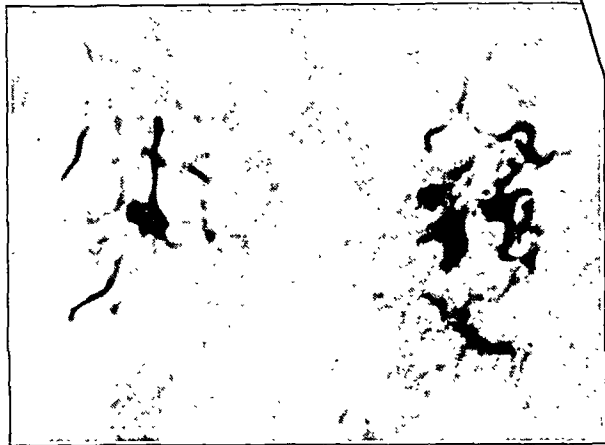


Fig. 3.—Higher magnification of the section in figure 2. Bacilli are clearly shown as long filaments with slight nodular irregularities suggesting beading. Slightly reduced from a photomicrograph with a magnification of 2,000 diameters.

organisms in dilutions reaching 1:1,600. Serum of the rabbit immunized with the known organisms agglutinated our organisms in dilutions reaching 1:1,600. The same antigens were not agglutinated by normal rabbit serum used as a control. The results are shown in table 1.

Biochemical Reactions.—Fermentation reactions were done by the method suggested by Deem and Williams⁵ with the extract from autoclaved swine blood corpuscles. The four sugars fermented were the same four that were constantly fermented by all thirty-seven strains of *Erysipelothrix rhusiopathiae* with which these investigators worked. The results are shown in table 2.

THE ORGANISM

Erysipelothrix rhusiopathiae is classified by Bergey⁶ among the so-called "higher bacteria" of the order Actinomycetales. There are three generally accepted strains: swine, human and mouse. These strains differ somewhat in morphology and virulence as the result of prolonged passage in their respective hosts. The bacillus is widely disseminated throughout the animal kingdom as a saprophyte of decomposing plant and animal material. As a "facultative parasite" it has been isolated from the tonsillar secretions in 50 per cent of healthy swine by Glässer⁷ and Pfeiler.⁸ Brunner⁹ recently reported its isolation from fish but concluded that fish only harbor the organism since they show no sign of disease. Virulence and species specificity are extremely variable. The organism has the capacity to change suddenly from a harmless saprophyte into a pathogenic parasite. Serial passage in pigeons increases

5. Deem, A. W., and Williams, C. L.: Fermentation Reactions of *Erysipelothrix Rhusiopathiae*, J. Bact. **32**: 303 (Sept.) 1936.

6. Bergey, D. H.: Bergey's Manual of Determinative Bacteriology, ed. 4, Baltimore, Williams & Wilkins Company, 1934, p. 533.

7. Glässer: Die Krankheiten des Schweines 1912, quoted by Arnholz, F.: Zur Pathologie und Therapie des Erysipelds, Arch. f. klin. Chir. **133**: 736 (April) 1925.

8. Pfeiler, A. H., quoted by Schnürer, J.: Deutsche tierärztl. Wchnschr. **35**: 161 (March 12) 1927.

9. Brunner, G.: Experimentelle Untersuchungen über Schweinerotlaufbakterien bei Fischen, Zentralbl. f. Bakt. (pt. 2) **97**: 457, 1938.

ulence for all species, while passage in rabbits increases virulence for swine. Pigeons and white mice are highly susceptible to experimental inoculation, rabbits and guinea pigs considerably less so. Man and swine are said to be relatively immune.

THE INFECTION IN SWINE

Swine erysipelas was first recognized as a definite entity and differentiated from anthrax in 1882 by Pasteur¹⁰ and his co-worker Thuellis, who first described

TABLE 1.—*Agglutination Reactions*

Antigen	Serum from Rabbit 1, Immunized with Our Organism						Control in Salt Solution	Serum of Control Rabbit	
	1:100	1:200	1:400	1:800	1:1,600	1:3,200		1:10	1:100
Saline suspension of known strain of Erysipelothrix rhusiopathiae	4+	4+	4+	4+	4+	—	—	—	—
Saline suspension of our organism	Serum from Rabbit 2, Immunized with Our Organism						—	—	—
	1:100	1:200	1:400	1:800	1:1,600	1:3,200			
	Serum from Rabbit 3, Immunized with Known Strain						—	—	—
	1:100	1:200	1:400	1:800	1:1,600	1:3,200			

and prepared a successful vaccine from organisms isolated from characteristic cutaneous lesions. The vaccine was prepared by serial passage of the organisms in rabbits, which these authors observed decreased its virulence for swine. While organisms so prepared are attenuated for swine, they still are virulent for man, and very severe infections have been reported in veterinarians accidentally infected with such cultures. Subsequent clinical and pathologic studies have divided this disease roughly into an acute form and several chronic manifestations. The disease in swine has been described in detail by Van Es and McGrath.¹¹ Briefly, in the acute form of the disease the picture is that of acute sepsis, with fever, loss of appetite, patchy ecchymotic discolorations of the skin and painful swelling of the joints. Death may result from increasing respiratory distress with pulmonary edema in from one to four days, or the acute symptoms may completely subside. The mortality in this form ranges between 50 and 100 per cent.

The chronic forms of infection may be continuous with the acute attack or may insidiously manifest themselves after several weeks of apparent good health. Chronic proliferative arthritis frequently with osteitis, an urticarial cutaneous inflammation commonly called "diamond skin," and bacterial endocarditis are the most commonly recognized chronic manifestations. Post-mortem observations on animals dying of endocarditis reveal most frequently on the mitral valve, and to a less extent on the aortic valve, large, wartlike or cauliflower appearing reddish yellow vegetations. The vegetations in all instances show a marked tendency to attack and invade the mural endocardium.¹²

The infection is commonly acquired through the gastrointestinal tract, but infection from skin abrasions is known to occur.

10. Pasteur, Louis: Extract d'une lettre de M. Pasteur à M. Dumas: physiologie pathologique: sur le rouget, ou mal rouge des porcs, *Compt. rend. Acad. d. sc.* 2:1120, 1882.

11. Van Es, L., and McGrath, C. B.: Swine Erysipelas, *Research Bulletin* 84, College of Agriculture, University of Nebraska.

12. Coombs, C. F.; Haddfield, G., and Henson, G. E.: Endocarditis of Swine Erysipelas and Its Relation to Cardiac Infections of Man, *Proc. Roy. Soc. Med. (Sect. Compar. Med.)* 19:13 (Feb.) 1926.

THE INFECTION IN MAN

Infections as a rule follow cutaneous abrasions or penetrating injuries to the hands. Infection through the gastrointestinal tract is exceedingly rare, but the case reported by Fiessinger and Brouet¹³ of infection following the ingestion of infected salt pork leaves little doubt as to the possibility of this route of infection. Following an incubation period of from one to five days there develops at the site of injury a sharply defined, slightly elevated zone of erythema with a characteristic purplish red coloration which slowly extends peripherally as the central area fades. The purple red and the slow progression of the infection differentiate it from true erysipelas. Extension above the wrists is rare, and lymphangitis and lymph node involvement with constitutional symptoms are seen only with the most virulent infections. Self limitation with spontaneous recovery in from one to four weeks is the rule. Suppuration is never observed. Attempts to recover the organism from characteristic cutaneous lesions by the usual methods of culturing small amounts of serum from the wound or aspirated material are always unsuccessful. However, culture of a small section of skin taken from an area of erythema will usually grow the organisms. Particularly severe forms are seen in veterinarians accidentally infected with virulent cultures. Klauder, Richter and Harkins² observed a severe form of erysipeloid disease in commercial fishermen of the Atlantic seaboard which they concluded was comparable to the severe form of erysipeloid disease observed from swine infections. Milder forms have been observed

TABLE 2.—*Biochemical Characteristics*

	Our Organism	Known Strain of Erysipelothrix Rhusiopathiae
Monosaccharides		
Pentoses		
Arabinose.....	—	—
Xylose.....	—	—
Hexoses		
Dextrose.....	Acid, no gas	Acid, no gas
Galactose.....	Acid, no gas	Acid, no gas
Fructose.....	Acid, no gas	Acid, no gas
Mannose.....	—	—
Disaccharides		
Sucrose.....	—	—
Maltose.....	—	—
Lactose.....	Acid, no gas	Acid, no gas
Trisaccharides		
Raffinose.....	—	—
Polysaccharides		
Starch.....	—	—
Inulin.....	—	—
Dextrin.....	—	—
Alcohols		
Dulcitol.....	—	—
Glycerol.....	—	—
Mannitol.....	—	—
Glucoside		
—	Slight acid	Slight acid
Catalase.....	—	—

from such sources as old cheese, infected game and commercial meat. Infection has been reported from such unusual sources as from injury to the hand on a stone in a dry creek, from carrying an opossum by the tail wrapped around the fingers, from skinning a rabbit and other contacts with rabbits by rabbit breeders, from handling recently thawed fish by an attendant in a zoological garden, from performing an autopsy on a dead animal in a zoological garden, from the sting of a jellyfish, from handling a dogfish (*Squalus acanthias*)

13. Fiessinger, Noël, and Brouet, Georges: Rouget du porc chez l'homme à forme porcine et d'origine digestive, *Presse méd.* 42:277 (June 2) 1934.

which apparently had lain on the beach for a long time and dried thoroughly in the sun, from the prick of a spine of a dried stuffed fish which was mounted and used as an ornament (Klauder and Harkins²), from infected sheep¹⁴ and from injury from a fish hook.¹⁵

Acute¹⁶ and chronic arthritis¹⁷ have been reported, the former as a concomitant complication and the latter as a late sequela of an original cutaneous infection. Endocarditis in man will be discussed under the review of the literature.

For a detailed description of erysipeloid infection the reader is referred to the papers of Klauder and his collaborators.²

REVIEW OF THE LITERATURE

Mention of endocarditis as "a very rare complication" of swine erysipelas infection in man was made by Van Es and McGrath,¹¹ Klauder, Righter and Harkins,² Klauder² (1926) and Rahm.¹⁶ However, Klauder was the only author who cited any reference, and that was to the two cases reported by Gunther.¹⁸ One of these cases is discussed at some length with postmortem observations in a German veterinary journal,¹⁹ not as a case of endocarditis complicating swine erysipelas infection in man but as a legal report involving insurance compensation. The patient was an Austrian veterinarian aged 29 who accidentally infected himself while vaccinating swine. A localized cutaneous infection at the site of injury was followed in three weeks by chills and fever, progressive weakness and signs of heart disease and in three months by death. At necropsy a thrombus-like deposit was noted on the mitral valve. The case was lost by the patient's widow, presumably because the physician who performed the necropsy testified that pyogenic bacteria had entered the circulation through the skin abrasion and attacked the mitral valve, since swine erysipelas infection was not known to be transmissible to man.

It is interesting to note that Gunther, having a more complete knowledge of swine erysipelas infection in man, reported this case and a similar case of an Austrian veterinarian with an identical story of accidental infection followed by sepsis, evidence of heart disease, and endocarditis observed at necropsy. Bacteriologic studies were lacking, however, in both cases. While Gunther reported these cases as endocarditis complicating swine erysipelas infection in man, he apologetically concluded that, because no causative organism was identified, the possibility of streptococcic endocarditis could not be excluded.

The fatal case reported by Prausnitz²⁰ of a 10 year old girl with a previously known congenital heart lesion, with sepsis and cutaneous and articular manifestations, should be added as another probable case of endocarditis caused by *Erysipelothrix rhusiopathiae*. Blood cultures repeatedly yielded an organism positively identified as "erysipeloid bacillus" (*Erysipelothrix rhusiopathiae*). Proof of the endocarditis was lacking, as permission for autopsy was refused.

14. Friedman, E.: Sur un cas de transmission à l'homme du rouget du mouton, Bull. méd., Paris 47: 623 (Sept. 30) 1933.

15. Pautrier, L. M.: Erysipéloïde consécutif à une piqûre d'hameçon, Bull. Soc. franç. de dermat. et syph. (Réunion dermat., Strasbourg) 40: 192 (Feb.) 1933.

16. Rahm, H.: Zur Schweinrotlaufarthritis der Fingergelenke, Klin. Wehnschr. 3: 224 (Feb. 5) 1924.

17. Kartal, S.: Die chronische Erysipeloidarthritis beim menschlichen Schweinrotlauf, Deutsche Ztschr. f. Chir. 244: 332, 1935.

18. Gunther, G.: Schweinrotlauf beim Menschen, Wien. klin. Wehnschr. 35: 1318, 1912.

19. Die Infektion eines Tierarztes mit tödlichem Ausgange, Tierarztl. Zentralbl. 26: 141, 1903.

20. Prausnitz, C.: Bakteriologische Untersuchungen über Schweinrotlauf beim Menschen, Zentralbl. f. Bakt. (pt. 1) 85: 362, 1921.

COMMENT

Points of interest in the case reported here are the probable source and portal of entry of the infection, the pathologic and bacteriologic observations, and the similarity of this disease to the chronic form of swine erysipelas infection with endocarditis seen in swine.

The occupational history of handling lobsters is not significant. While no specific mention of erysipeloid infection among lobster fishermen was found in the literature, Gilchrist²¹ in 1903 reported 323 cases caused by crab bites or lesions produced by crabs. Klauder, Righter and Harkins² have reported 1,000 cases of erysipeloid in commercial fishermen of the Atlantic seaboard, and an epidemic of 200 cases in which the infection was acquired from cleaning fish has been reported from Odessa.²² These reports of erysipeloid in kindred occupations indicate that the handling of lobsters likewise would be hazardous as regards this infection.



Fig. 4.—Swine's heart showing bulky vegetations on the mitral valve caused by *Erysipelothrix rhusiopathiae*. This specimen was lent for study by the Pathological Division of the Animal Industry Bureau of the United States Department of Agriculture in Washington, D. C.

The history sheds no light on a portal of entry for this infection. An expected story would have indicated a cutaneous abrasion followed by a localized infection, with or without constitutional symptoms and polyarthritides, preceding the symptoms of chronic heart disease. The only cutaneous lesion mentioned in the history seems to deserve no consideration as a portal of entry because it appeared one month after the onset of the disease. The arthritis mentioned likewise seems irrelevant, as it had been present for several years. However, the patient was not specifically questioned concerning lesions on the hands because the organism was not identified as *Erysipelothrix rhusiopathiae* until several weeks after death. For this reason it is felt that the probable portal of entry was a small erysipeloid lesion that was given little consideration by the patient and completely escaped the notice of his family.

Infection through the gastrointestinal tract is rarely reported in man and appears most unlikely in this

21. Gilchrist, T. C.: Erysipeloid, with a Record of 329 Cases of Which 323 Were Caused by Crab Bites or Lesions Produced by Crabs, J. Cutan. Dis. 22: 507, 1904.

22. Stefansky, W. K., and Grünfeld, A. A.: Eine Epidemie des Erysipeloids in Odessa, Zentralbl. f. Bakt. (pt. 1) 117: 376 (July 11) 1930.

ase. The hospital course, typical of sepsis and endocarditis, needs no comment.

The endocarditis observed was not strikingly unusual. The mycotic aneurysm, the small abscesses in the myocardium adjacent to the aortic ring, and the bulky vegetations are characteristic of a moderately acute, combined ulcerative and vegetation-forming process. This is entirely compatible with the history of about three months of illness. The endocarditis as observed in swine usually involves the mitral valve, but the bicuspid aortic valve of this man was no doubt responsible for the localization of the endocarditis on that valve. The tendency of the vegetations in swine to invade the mural endocardium was not conspicuously remarkable in this case. A small area of endocardium was involved but to no greater extent than might have been expected from vegetations produced by a streptococcus.

The organisms recovered from the six antemortem blood cultures and from the heart's blood and the endocardial vegetation at necropsy were identical with the known strain of *Erysipelothrix rhusiopathiae*. In addition to our own results the organism from this case was likewise identified as *Erysipelothrix rhusiopathiae* by the Pathological Division of the Bureau of Animal Industry of the United States Department of Agriculture in Washington, D. C.

SUMMARY AND CONCLUSIONS

Three probable cases of endocarditis caused by *Erysipelothrix rhusiopathiae* have been collected from the literature. In two of these an expected and typical history of infection was obtained and endocarditis was observed at necropsy but bacteriologic confirmation was lacking. In the third case, with a clinical course suggestive of endocarditis and repeated blood cultures positive for *Erysipelothrix rhusiopathiae*, the endocarditis was not confirmed as a necropsy was not performed.

The case here reported is believed to be the first proved case of endocarditis caused by *Erysipelothrix rhusiopathiae*²³ with complete necropsy and bacteriologic studies. This disease is an instance of a chronic form of *Erysipelothrix* infection in man and a fatal complication of erysipeloid disease and is similar in all respects to the endocarditis complicating swine erysipelas. The apparent rarity of the disease, as suggested by the literature, with only three questionably identified cases is probably not entirely justified. While endocarditis in swine is an infrequent complication of swine erysipelas, it is observed and generally recognized by veterinarians. For this reason the opinion is ventured that more cases in man will be recognized in the future as the prevalence of erysipeloid infection is rapidly being publicized in the medical literature.

23. Credit is due Miss Marion Sweet, of the laboratory of the Children's Hospital, Boston, for first identifying this organism.

PRIMARY SUPPURATION OF LIVER DUE TO FRIEDLAENDER'S BACILLUS

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The observation of liver abscess, single or multiple, in a hospital practice is of itself too frequent to warrant addition to the existing voluminous literature on this subject. Thorough studies of large series have been contributed by many authors, particularly when the infecting organism has been *Endamoeba histolytica*, *staphylococcus*, *streptococcus*, *Bacillus coli*, *Bacillus pyocyaneus* and many others. Numerous contributions concerning liver abscess are available in the literature, with the number of reported cases varying from ten to 186 (Ochsner and others,¹ Norris and Farley,² Martin,³ Huard and Meyer,⁴ Gessner,⁵ Elsberg⁶). However, there are few cases on record in which Friedländer's bacillus has been isolated as the cause. Even though it has been recognized that infection with Friedländer's bacillus may involve regions of the body other than the respiratory system (Brouardel,⁷ Bamforth,⁸ Scheyer,⁹ Howard,¹⁰ Park, Williams and Krumwiede¹¹ and Alessandri¹²), a critical analysis of the American and foreign literature since the beginning of the century reveals not more than twenty-five cases of liver suppuration wherein this organism was accurately identified (Hegler and Nathan,¹³ Le Sourd and Drailard,¹⁴ Carnot, Dumont and Libert,¹⁵ Eliason,¹⁶ Gilbert-Dreyfus and Dausse,¹⁷ Potier,¹⁸ Courmont and Chalié¹⁹). Courmont and Dujol²⁰ isolated Friedländer's bacillus from a patient with suppurative chole-

Dr. Boettiger died Feb. 1, 1939.

1. Ochsner, Alton; DeBakey, Michael, and Murray, Samuel: *Pyogenic Abscess of the Liver*, Am. J. Surg. **40**: 292 (April) 1938.

2. Norris, G. W., and Farley, D. L.: *Abscess of the Liver*, M. Clin. North America **10**: 17 (July) 1926.

3. Martin, Walton: *Spread of Bacteria from Gallbladder to Liver*, Ann. Surg. **90**: 47 (July) 1929.

4. Huard, P., and Meyer, May J.: 150 observations d'abcès du foie, Mém. Acad. de chir. **62**: 169 (Feb. 12) 1936; 43 autopsies d'abcès du foie, Ann. d'anat. path. **13**: 885 (July) 1936.

5. Gessner, H. B.: *Review of 96 Cases of Abscess of Liver*, New Orleans M. & S. J. **85**: 793 (May) 1933; *Abscess of Liver*, Am. J. Surg. **20**: 683 (June) 1933.

6. Elsberg, C. A.: *Solitary Abscess of the Liver*, Ann. Surg. **41**: 217, 1906.

7. Brouardel, M.: *Note sur les infections septicémiques à bacilles de Friedländer*, Bull. Acad. de méd., Paris **96**: 246 (Nov. 16) 1926.

8. Bamforth, J.: *Investigation of Bacilli of Capsulatus-Mucosus Group*, J. Hyg. **27**: 343 (June) 1928.

9. Scheyer, H.: *Der Bacillus Pneumoniae Friedländer als Erreger gynäkologischer Erkrankungen*, Ztschr. f. Gynec. **1**: 3187, 1926.

10. Howard, S. E.: *Bacteriologic Findings in Epidemic Influenza*, Bull. Johns Hopkins Hosp. **30**: 13, 1919.

11. Park, W. H.; Williams, A. W., and Krumwiede, Charles: *Pathogenic Microorganisms*, Philadelphia, Lea & Febiger, 1929.

12. Alessandri, Roberto: *Surgery of the Liver*, in Nelson-Low-Leaf Living Surgery, New York, Thomas Nelson & Sons, 1928.

13. Hegler, C., and Nathan, H.: *Duday and Friedländer-Bacillen-Sepsis*, Klin. Wchnschr. **11**: 1900 (Nov. 12) 1932.

14. Le Sourd, L., and Drailard, R.: *Méningite cérébro-spinale et abcès du foie à pneumobacille de Friedländer*, Gaz. d. hôp. **105**: 1185 (Aug. 10) 1932.

15. Carnot, P.; Dumont, J., and Libert, E.: *Infection of Liver and Biliary Tract Caused by the Friedländer Bacillus*, Paris méd. **1**: 479 (May 24) 1930.

16. Eliason, E. L.: *Pylephlebitis and Liver Abscess Following Appendicitis*, Surg., Gynec. & Obst. **42**: 217, 1906.

17. Gilbert-Dreyfus and Dausse, C.: *Abcès du foie à pneumobacille de Friedländer*, Rev. méd.-chir. d. mal. du foie **4**: 481, 1929.

18. Potier: *Liver Abscess Due to Friedländer Bacillus*, Bull. Soc. anat. de Paris, p. 500, 1892.

19. Courmont and Chalié: *Abscess of the Liver Due to Friedländer's Bacillus*, Lyon méd. **2**: 163, 1908.

20. Courmont, P., and Dujol, G.: *Reproduction expérimentale d'abcès du foie, avec un pneumobacille de Friedländer, d'une cholestite humaine*, Lyon méd. **110**: 938 and 973, 1912.

Blood Calcium.—Calcium occurs in the blood in two forms, ionized or combined with protein. The normal content is about 10 milligrams per cent. Considerable variations from that concentration may be dangerous. If blood calcium is lowered by taking it out of solution, twitchings and convulsive movements follow. They can be quickly relieved by injecting enough of a soluble calcium salt to restore the proper percentage. Removal of the parathyroid glands, four small structures near the thyroid gland in the neck, reduces the blood calcium to less than 7 milligrams per cent, without any change in the content of sodium or potassium. As the concentration approaches 5 milligrams per cent convulsions appear.—Cannon, Walter B.: *The Wisdom of the Body*, New York, W. W. Norton & Co., Inc., 1939.

cystitis and liver abscess and by inoculation into a guinea pig produced a liver abscess. Baeher, Schwartzman and Greenspan²¹ carefully studied 198 patients with Friedländer bacillus infection, and in only ten of the fourteen fatal cases were one or more liver abscesses revealed by operation or necropsy. Rothenberg and Linder²² recorded twenty-four instances of single pyogenic liver abscess, but only two were due to Friedländer's bacillus.

Strangely enough, both of our patients had no evidence of a prior focus of entry at the time their infection was found localized in the liver. Such an onset is uncommon, since single or multiple pyogenic liver abscesses follow acute suppurative appendicitis, acute empyema of the gallbladder, chronic ulcerative colitis and other similar conditions.

PATHOLOGY

Bacteria carried to the liver do not necessarily proliferate but may be actually destroyed in the liver tissue. Chromatolysis and vacuolation of the liver cells with the formation of free pigment result.²³ Hepatic tissue is particularly resistant to infection. Not only does it possess strong antitoxic properties, but it also exerts a bactericidal action. This theory is supported by the frequency with which certain micro-organisms, for example the typhoid bacillus, are eliminated through



Fig. 1 (case 1).—Liver and diaphragm showing subdiaphragmatic pockets (A) and irregular hepatic abscesses (B).

anatomic or functional obstacle to free elimination of the invading organisms, because of their numerical virulence, are permitted to flourish. In the cases here reported there was no evidence of an abscess of inflammation due to the Friedländer bacillus,



Fig. 2 (case 1).—A, diaphragm showing suppurative inflammation; B, inflammatory cells.

one considers the history of bronchitis that preceded the onset of symptoms referable to the liver as indicating the existence of the origin of infection. At operation and at autopsy no inflammatory or calculous disease of the gallbladder was observed. Evidently there was no mechanical disturbance in the flow of bile. The liver suppuration probably resulted from the implantation there of a virulent strain of the organism, in one of the cases definitely by way of the portal vein. One must bear in mind the fact that this organism may be a normal inhabitant of both the respiratory and the intestinal tract.

The possible pathways to the liver are the portal veins, the hepatic artery, the bile ducts and the lymphatics. In gravely ill patients with bacteremia, the hepatic artery may be the port of entry, the abscesses then being small and multiple. When the bile ducts are the mode of distribution, the infection is an ascending one and the pattern corresponds to the architecture of the biliary duct system; small, bright yellow areas are visible, the color being due to the bile pigment. Lastly, the lymphatics may carry the infection, as in diffuse peritoneal involvements; but this route is rare.

If the infection travels by way of the portal veins, pylephlebitis with abscesses follows. Such abscesses are small and correspond in distribution to the portal venous branches. If septic emboli reach the liver, small abscesses form in large numbers. Surrounding

21. Baeher, George; Schwartzman, Gregory, and Greenspan, E. B.: *Bacillus Friedländer Abdominal Infections Due to Suppurative Lesions of the Intestinal Tract*, J. Mount Sinai Hosp., 4: 225 (Nov.-Dec.) 1937.

22. Rothenberg, R. E., and Linder, William: *Single Pyogenic Liver Abscess: Study of 24 Cases*, Surg., Gynec. & Obst., 59:31 (July) 1934.

23. Heyd, C. G.: *Changes in the Liver Associated or Coincident with Infection of the Appendix*, J. A. M. A., 83: 1403 (Nov. 1) 1924.

The abscess focus are zones of intense congestion. Parenchymatous damage occurs in the liver cells, varying in degree from cloudy swelling, fatty degeneration and focal hepatic necrosis to a picture closely resembling acute yellow atrophy.⁶



Fig. 3 (case 1).—Center of liver abscess showing massive necrosis of tissue with polymorphonuclear and mononuclear cellular infiltration.

Pyogenic abscesses may be found in any part of the liver, but the right lobe is more frequently and more extensively involved than the left. In addition, because of the large caliber of the right portal vein and its direct course, emboli lodge in this branch more frequently. Extensions of suppuration may travel from one lobe to the other, eventually resulting in great destruction, replacement, and compression atrophy of liver parenchyma. Subdiaphragmatic loculations usually result from the breaking of these abscesses through the thin shell of peripheral liver tissue.

SYMPTOMS AND SIGNS

Both of our patients were men in the fourth and fifth decades of life. For several weeks prior to hospitalization they had been troubled by a cough with expectoration. For this symptom medical treatment was sought. The expectoration was thick and consisted of tenacious mucopus, neither colored by blood nor of foul odor. The second patient had the typical bloody expectoration (so well described by Solomon²⁴) only in the later stages, when consolidation must have been present.

In both of our patients episodes of chills, fever and sweats were outstanding and troublesome occurrences. The chills were sudden in onset and lasted for from several minutes to as much as one hour. Many were of such intensity as to cause the patient to shake the

bed noticeably. The temperature often rose sharply from 100 to 106 F., suddenly receding. Following the hyperpyrexia, profuse sweating would set in and the patients were again comfortable. Between attacks they seemed so well that one hardly expected the recurrence of another episode of chills and fever within the next few hours.

As for gastrointestinal manifestations, the first patient never experienced abdominal pain. However, for the week prior to admission he vomited at irregular intervals. After the abdomen was palpated and the enormous tender hepatic enlargement detected, the absence of abdominal discomfort or pain seemed to be the more remarkable. Therefore one can readily understand why the second patient, with no hepatomegaly, also experienced no gastric disturbances whatever. However, jaundice set in at an early date and was progressive.

Blood cultures from the first patient yielded a pure growth of Friedländer's bacillus. In the second case the blood was sterile, even at the height of a marked febrile reaction. Blood smears from both patients showed a reduction in erythrocytes, an increase in total white cells (12,000 to 15,000 per cubic millimeter) and polymorphonuclear leukocytosis (80 to 90 per cent). The hemoglobin was greatly reduced by the severity of the illness.

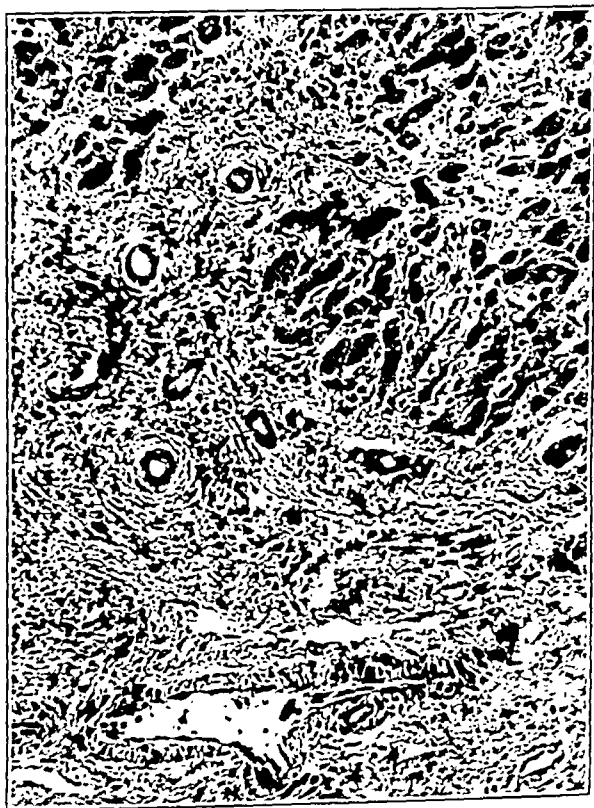


Fig. 4 (case 1).—A view of interstitium and portions of hepatic lobules showing distortion of their architecture.

With our first patient, a diagnosis of liver suppuration was made prior to operation, and the detection of Friedländer's bacillus as the infecting organism was a distinct surprise. With this experience in mind, the examination of the second patient suggested to us the diagnosis of a primary infection of the liver, of Friedländer's bacillus origin. In substantiation of this

²⁴ Solomon Saul: Primary Friedländer Pneumonia: Report of Thirty-Two Cases, *J. A. M. A.* 108:937 (March 20) 1937.

diagnosis were the previous history of cough, chills, hyperpyrexia and sweats, blood studies giving no evidence of malaria and amebiasis, and localization of the infection in the liver as evidenced by progressively increasing jaundice.

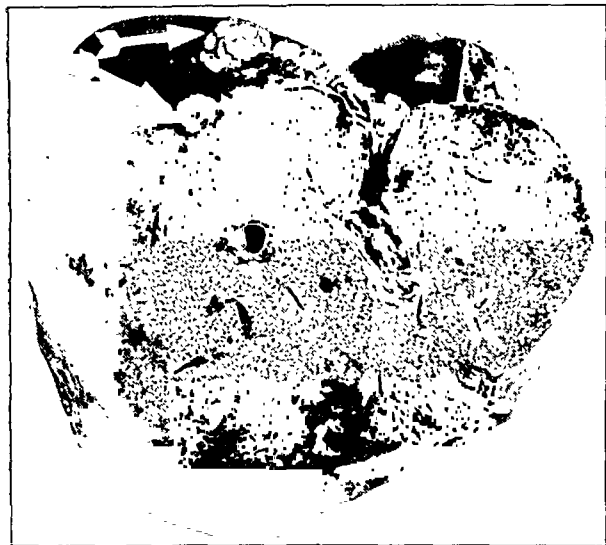


Fig. 5 (case 2).—Horizontal section of the liver illustrating the abscesses.

In both cases aspiration was attempted through the posterior extraperitoneal space, but this yielded no helpful data. When small abscesses are present, as in pylephlebitis and ascending biliary tract infections, one should not be disappointed by aspiration which yields negative results. The great enthusiasm of Wilmoth²⁵ for this diagnostic procedure was based on his experiences with amebic abscesses of huge size, as found in the tropics. Only if performed below the twelfth rib posteriorly in a direction forward and upward does aspiration afford little chance of contaminating a surgically clean pleural or peritoneal cavity. Barnard²⁶ reported a case in which transpleural aspiration of a perihepatic abscess was followed three hours later by the collapse and death of the patient. At autopsy 1½ pints (0.75 liter) of pus was found to have leaked into the pleural cavity, causing the patient's death.

Roentgenographic studies may be helpful in certain cases. In one of our cases we were able to visualize a high diaphragm and a displaced heart whenever the liver parenchyma filled with large collections of suppuration or when extensive subphrenic accumulations formed. Roentgenograms of the pulmonary field are of as little help as physical signs in detecting Friedländer's bacillus infection. However, after pulmonary consolidation has already formed, the affected areas may be located by this technic.

TREATMENT

Surgical intervention is indicated for two reasons: first, for the drainage of already formed hepatic abscesses; second, to avoid overlooking other localizations of pus such as subphrenic abscess and suppurative cholecystitis, even though, as in pylephlebitis, one is certain that hepatic abscesses of minimal size are present. If proper and careful exploratory aspiration

has been previously done, as already outlined, and pus has been encountered, one may conclude that a minimal quantity of pus is present, usually in the form of multiple small abscesses. If pus is located in the extreme anterior and superior portion of the liver, aspiration with the needle might not reveal it. Therefore if the surgeon always uses a posterior extraperitoneal operative approach, especially as recommended by Ochsner and Graves,²⁷ not only may he contribute nothing toward the establishment of an accurate diagnosis but his operative procedure may be totally ineffective for the relief of suppuration.

The patient is prepared for operation with blood transfusions and the intravenous administration of large quantities of dextrose. These measures are designed to replace water loss and replenish the glycogen reserve of an already depleted liver. A transperitoneal operative approach is made through a high rectus incision, and a careful exploration of all the abdominal viscera is carried out. A walled off perforation such as of a hollow intestinal viscus can thus be properly cared for (perforated peptic ulcers, acute suppurative appendicitis, diverticulitis of colon). Suppurative cholecystitis with cholangitis may be encountered independently of or in association with liver abscess, and for these surgical drainage is indicated.

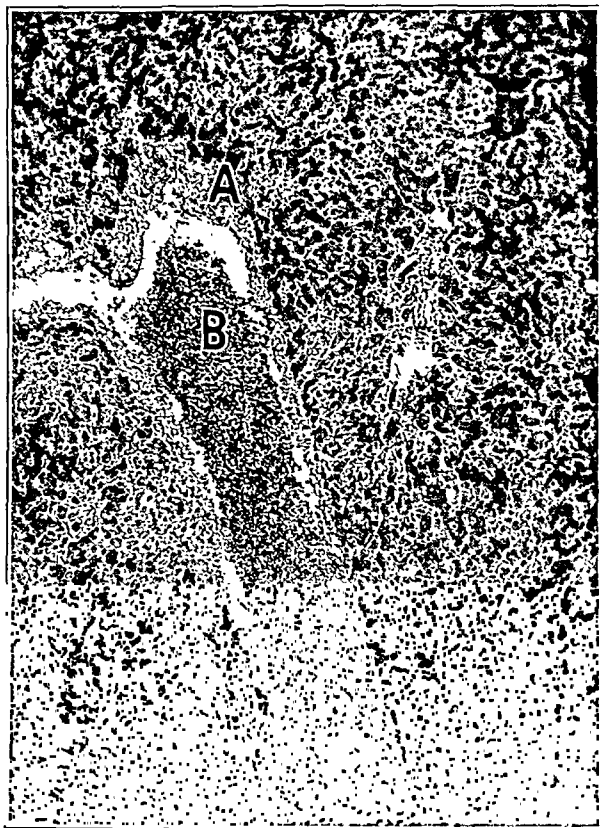


Fig. 6 (case 2).—Section through liver and large radicle of portal vein showing thrombus; A, vein wall; B, thrombus.

If hepatic abscesses of appreciable size are opened, an attempt should be made to create one large abscess cavity by connecting all loculations. Lastly, the subphrenic spaces should be explored for possible extensions of pus from the liver parenchyma.

25. Wilmoth, C. L.: The Use of Exploring Needles and Shadow-Casting Media in the Diagnosis of Hepatic and Perihepatic Abscess, *Ann. Surg.* 93: 723 (March) 1931.

26. Barnard, H. L.: Surgical Aspect of Subphrenic Abscess, *Brit. M. J.* 1: 371-429, 1908.

27. Ochsner, Alton, and Graves, A. M.: Subphrenic Abscess, *Ann. Surg.* 98: 961 (Dec.) 1933.

In the second case reported, the Friedländer bacillus, although suspected, was never isolated until the operation. The miliary liver abscesses yielded a heavy growth of the organisms, the gallbladder content less and the peritoneal fluid the smallest number.

REPORT OF CASES

CASE 1.—History.—W. S., a man aged 54, born in Finland, married, a chauffeur, admitted to St. John's Long Island City Hospital Dec. 9, 1936, at 1 p. m., for several years had been troubled with constipation, indigestion, nausea after meals and frequent gaseous eructations. His chief complaints were chills, fever and occasional vomiting. There was a chronic productive cough of several years' standing. Prior to his admission his family physician treated him for "bronchitis" and for dyspnea on slight exertion.

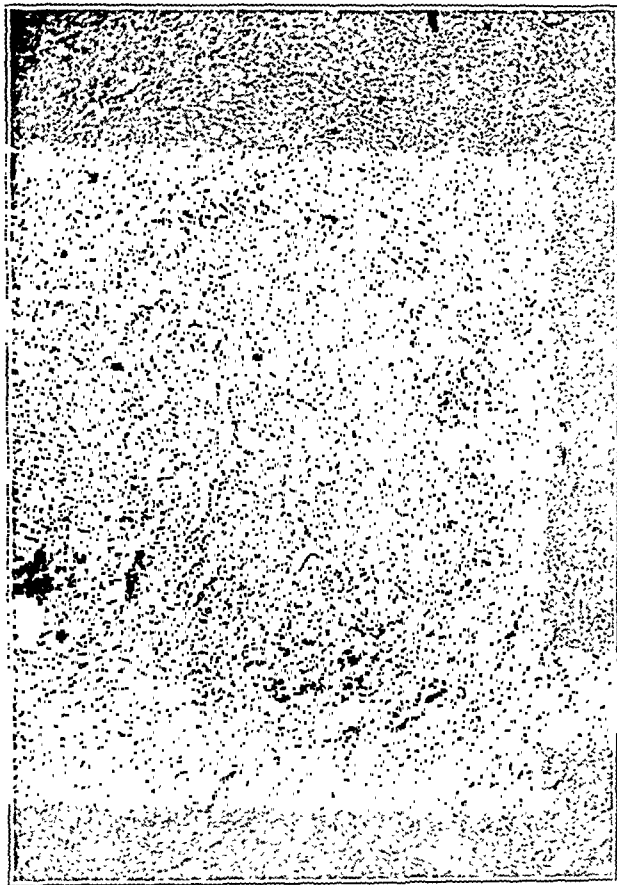


Fig. 7 (case 2).—Section of liver showing the abscess.

The onset of his present illness was seven weeks before, with a "sticking" pain in the region of the right shoulder, chills and fever. These attacks occurred almost two and three times a day and were followed by profuse and prolonged sweating. Abdominal pain was never experienced, but for the past week he had vomited at irregular intervals.

Physical examination revealed that the patient was dyspneic and orthopneic and acutely ill, with pulse rate 140 per minute, respiratory rate 40 per minute and blood pressure 88 mm. of mercury systolic and 52 mm. diastolic. The pulmonary fields showed fine and coarse rales only over the lower right part of the chest. Abdominal examination disclosed an enlarged and tender liver, the lower edge extending to a point midway between the umbilicus and the ensiform cartilage. The entire abdomen was moderately distended, and a gallbladder tumor was not felt. Urinalysis disclosed a faint trace of albumin with an occasional white blood cell and granular cast in a high power field. Sputum typing yielded positive results with type I serum (Neufeld reaction). Erythrocytes numbered 4,200,000, with hemoglobin content 87 per cent; leukocytes numbered

12,750, with 90 per cent polymorphonuclear leukocytes, 6 per cent lymphocytes, 3 per cent monocytes, and 1 per cent myelocytes. The laboratory reported no sign of *Mycobacterium tuberculosis* in the sputum smear or of malarial parasites in the blood smear and a negative Wassermann reaction of the blood. Culture of blood taken on the day of admission revealed gram-negative bacilli of the Friedländer group. The icterus index was 9.4. Exploratory aspiration of the liver and subphrenic space was attempted posteriorly, but no pus was obtained.

For the following two days the patient's condition remained unchanged; wide excursions of fever reaching 104 F. were preceded by a severe chill and followed by a profuse sweat. Roentgenographic studies as well as all other evidence pointed toward the presence of suppuration in the right upper region of the abdomen.

Operation.—This was done December 12. Anesthesia was induced with nitrous oxide and oxygen followed by open drop ether. The peritoneal cavity was opened through a right rectus incision beginning at the right costal margin and extending downward. The liver was markedly enlarged, with the lower margin just above the umbilicus. Through the smooth, glistening anterior surface of the right lobe an area of softening was palpated. The lateral half of the left lobe could likewise be indented by the palpating finger. However, the left lobe, in addition, contained small, yellow-brown areas 3 mm. in diameter on the anterior and inferior surfaces. At this point during the operation exploration of the rest of the peritoneal cavity was undertaken, revealing only a few pericecal adhesions to the lateral pelvic wall. Incision into the liver substance exposed an abscess from 8 to 9 cm. in diameter, situated in the supero-anterior portion of the right lobe. The pus was thick, yellow-green and without foul odor. A thin layer of liver tissue covered by peritoneum formed the roof of the abscess. The left lobe contained pus without a distinct cavity. Here the suppuration spread diffusely through narrow channels. Both liver lobes were widely opened and drained with gauze-filled Penrose drains. A stab wound for a rubber tube was made in the right lower quadrant.

Bacteriologic examination of pus from the liver demonstrated an encapsulated gram-positive bacillus identified culturally as belonging to the Friedländer group.

December 19, the seventh postoperative day, the temperature rose for the first time to 101.2 F. By the tenth postoperative day, December 21, it reached 104.2 F., with a corresponding increase in pulse and respiratory rate. However, the patient did not appear critically ill in spite of these marked rises in temperature and renewed attacks of chills, fever and sweats.

December 26 the wound was further explored with the patient under nitrous oxide anesthesia, and the pus cavities in the right and left lobes were drained more widely. However, following this second operation chest signs rapidly developed and the patient died Jan. 4, 1937.

Significant Pathologic Features.—The lungs showed lobar pneumonia involving the right upper and middle lobes and the left upper lobe, with bilateral fibrinous pleurisy. There were multiple abscesses of the kidneys and fibrous adhesions between the loops of small intestine. The liver weighed 2,875 Gm. No thrombophlebitis was found in the portal vein. There was an irregular abscess cavity involving the right lobe of the liver, and related to this but not directly connected with it were several subdiaphragmatic pockets of pus. A smaller abscess cavity was found in the left lobe. The causes of death were lobar pneumonia, liver abscesses and Friedländer bacillus septicemia.

CASE 2.—History.—L. S., a man aged 45, born in the United States, an insurance agent, admitted to the Boulevard Hospital March 18, 1938, complained chiefly of chills, fever, sweats and occasional abdominal pain. Both medical and surgical past histories were irrelevant.

Ten days prior to admission he woke up during the night with moderately severe generalized abdominal pain. The following morning he was seized with a chill followed by a high rise in temperature. The same evening the temperature was

normal and he felt much better. However, on the following day the temperature again rose, this time to 103 F. Ever since this time it had showed an intermittently septic course. Four days prior to admission he became progressively jaundiced, coughed and expectorated thick mucopurulent sputum, which was without a foul odor. This condition lasted only two or three days, at which time the cough and expectoration ceased. Careful examination of the sputum disclosed no pneumococci, but many gram-negative rods were in evidence on all occasions. This condition lasted for one week, when there occurred frequent chills, high fever and jaundice. The chills were so severe that some lasted as long as one hour with a rise in temperature up to 105 or 106 F. Strangely enough, at the termination of an attack of chills and fever the patient no longer appeared acutely ill.

On admission and immediately thereafter the temperature reached a height of 105.4 F. and receded to 99.8 F. The pulse rate was 120 per minute and the respiratory rate 40 per minute. On physical examination the patient seemed well nourished and not acutely ill. The skin and conjunctivas indicated an intense degree of jaundice. The lung fields were normal on physical examination as well as on x-ray study. The abdomen was greatly distended but revealed no areas of tenderness and no masses. Exploratory aspiration in the subdiaphragmatic and hepatic spaces posteriorly gave negative results. Urinalysis always revealed bile. March 19 the blood showed 3,590,000 erythrocytes, 14,350 leukocytes, 73 per cent hemoglobin, 80 per cent polymorphonuclears, 4 per cent monocytes, 14 per cent lymphocytes and 2 per cent myelocytes. By March 22 the leukocytes increased to 21,350, the hemoglobin dropped to 67 per cent and the polymorphonuclear leukocytes increased to 88.5 per cent. Smears for malarial parasites were negative, and repeated blood cultures were also negative.

Operation.—With use of subdural block anesthesia the peritoneal cavity was opened through a right rectus incision and a moderate amount of thin odorless yellow fluid was encountered. More than a pint was removed by suction. The entire liver surface, especially the right lobe, contained innumerable light yellow softened areas ranging from a few millimeters to 2 and 3 cm. in diameter. The larger involved areas were raised above the surface and soft to palpation. The picture was one of multiple liver abscesses. Aspiration of a large abscess with needle and syringe revealed liquefied necrotic material, culture of a specimen of which was taken. The gallbladder was incised and a large rubber tube was inserted for drainage. Along the portal system and bile ducts many enlarged lymph glands were palpated. No calculi were felt.

No difficulty was experienced in recovering Friedländer's bacillus from all three specimens, namely liver abscesses, gallbladder content and free abdominal fluid. Intensive treatment with sulfanilamide was given; blood samples showed 10.7 mg. per hundred cubic centimeters in the blood stream. However, the patient became progressively worse, jaundice deepened and the stools were clay colored. Chills, high fever and sweats continued, and he died April 6, the ninth postoperative day.

Significant Pathologic Features.—The lungs weighed 820 Gm. and showed bronchopneumonic consolidation involving the left lower lobe. The liver on section showed multiple abscesses, more numerous but smaller in the left than in the right lobe. The portal venous wall was thickened and adherent to its intima but not completely occlusive; friable thrombus was noted.

CONCLUSIONS

1. Liver abscess due to the Friedländer bacillus is a rare occurrence, especially when the involvement is primary in the liver itself.
2. The sites of entry may be the portal vein, the biliary tract system, the hepatic artery or the lymphatics.
3. Nearly all patients have chills, fever and sweats with a relatively small amount of abdominal distress.
4. The transperitoneal approach permits both thorough exploration and effective drainage.

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VISUALIZATION OF SPONTANEOUS INTERNAL FISTULA OF THE BILIARY TRACT

BY ROENTGEN RAYS

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The preoperative diagnosis of spontaneously occurring internal biliary fistula is a difficult one and intriguing to the inquisitive physician. Fistulas between some portion of the biliary tract and stomach or duodenum are rarely visualized roentgenographically, and relatively few such roentgenograms are found in the literature. We report here one extensive and one partial visualization of the bile tracts, showing not only retroflux of barium sulfate taken by mouth but also so-called air or gas shadows in the intrahepatic biliary tree.

Internal fistulas of the biliary tract are found in about 0.4 per cent of autopsies.¹ In 384 biliary fistulas



Fig. 1 (patient M. N.).—Appearance after a barium sulfate meal. The biliary passages are filled with barium sulfate, which has regurgitated through the fistula at A into what is probably a small gallbladder at B. The common duct is hugely dilated and shows a semicircular filling defect at C. Barium sulfate is seen in outlying liver ducts, as at D.

of all varieties collected by Naunyn,² 171 were internal (spontaneous): 108 into the duodenum, twelve into the stomach, forty-nine into the colon, one into the ileum and one into the jejunum. Judd and Burden³ in 1925 reviewed 153 histories of patients with biliary fistula operated on at the Mayo Clinic and stated that for none of these was a preoperative diagnosis of fistula made. Graham, Cole, Copher and Moore⁴ mentioned the infrequency of the clinical diagnosis but suggested that the barium sulfate meal will, on rare occasions, reveal a gastrointestinal biliary fistula. Soma Weiss⁵ discussed the problem in an instructive manner at some length and presented the two excellent x-ray studies of Holzman-Abrams and Habbé-Smith. The

From the Women and Children's Hospital.

1. Roth, Schroeder and Schloth, cited by Judd and Burden.³
2. Naunyn, Bernard: *On Cholelithiasis*, translated by A. E. Garrod. London, New Sydenham Society, 1896, p. 143.
3. Judd, E. S., and Burden, V. G.: *Ann. Surg.* 81: 305-312 (Jan.) 1925.
4. Graham, E. A.; Cole, W. H.; Copher, G. H., and Moore, Sherwood: *Diseases of the Gallbladder*, Philadelphia, Lea & Febiger, 1928.
5. Weiss, Soma: *Diseases of Liver, Gallbladder and Pancreas*, New York, Paul B. Hoeber, Inc., 1935, pp. 705-715.

textbooks and monographs on roentgenography of the biliary tract either do not mention (Barsony,⁶ George and Leonard,⁷ Schittenhelm,⁸ Bertwistle⁹) biliary fistulas or merely refer to an occasional visualization by barium sulfate meal (Schinz, Baensch and Friedl,¹⁰ Carman and Miller,¹¹ Barclay,¹² Henschen,¹³ Albrecht,¹⁴ Harrison¹⁵).

Firor¹⁶ in 1933 reviewed the roentgenologic literature and found recorded two hepatobronchial, one gastrobiliary, thirty-six duodenobiliary and four biliary-colonic spontaneous fistulas. Carman¹¹ in 1917 reported the first visualization of the biliary tract obtained by means of barium sulfate given orally to a patient with carcinoma at the pyloric end of the

duced by inserting a T tube into the common duct at operation, the injection of iodized sesame oil (iodipin 40 per cent) into the tube outlines the tract in its entirety, and it is by this method that the most beautiful roentgenograms of the hepatic system have been obtained (Doubilet and Colp,²¹ Walters, McGowen, Butsch and Knepper²²). In the presence or absence of spontaneous internal biliary fistula, gallbladder dye given orally or intravenously rarely outlines the intrahepatic ducts, but it has been reported by Dienst.²³

In the following case the history was more complicated by the persistence of gastric symptoms, without selective dyspepsia, than is usual in cases of bile tract disease:

M. N., a woman aged 55, with hypertension of twenty-nine years' duration and moderately severe diabetes known to be present four years, complained of attacks of epigastric pain with occasional jaundice present at intervals for thirty-two years. Gallstones had been diagnosed by a previous physician, and operation had been refused. For the past two years her attacks of epigastric pain, radiating to the right costal margin and under both shoulder blades, had been increasingly frequent. The patient entered the hospital in an especially severe attack characterized by right upper quadrant pain and muscle resistance, chill with high fever of the intermittent explosive sort, slight jaundice and bile in the urine, but without clay colored stools. She had vomited a considerable amount of "black" gastric content just before entrance but did not repeat this type of vomitus. In the days following, the notable feature of her complaint was its gastric character. Any food, but more markedly large meals, immediately brought on the pain in the epigastrium and "under the right ribs." This pain might assume a very sharp aspect but was of varying duration after eating, lasting from ten minutes to four hours. X-ray study with dye given orally produced nonvisualization of the gallbladder without calcifications in the gallbladder or liver regions. Barium sulfate given by mouth, however, after the first few swallows outlined the biliary system in its entirety and produced the unmistakable picture shown in figure 1.



Fig. 2 (patient M. N.).—Appearance ten days after that shown in figure 1. Residues of the barium sulfate taken orally ten days earlier are seen at D. Higher in the mid-portion of the shadow of the right lobe of the liver are seen negative branching shadows of air in the dilated hepatic ducts.

stomach. A spontaneous communication between duodenum and gallbladder had been established. Akerlund is usually mentioned as the first to call attention to the outlining of the biliary tract by air. His roentgenograms, however, were obtained by injection of air through external biliary fistulas of operative origin (1917). Busi¹⁷ should probably be given credit for describing in 1919 the first x-ray visualization of a spontaneous internal fistula between gallbladder and duodenum by means of gas shadows and barium sulfate given orally. Erosion by gallstone had caused this fistula. As late as 1929 Friedrich¹⁸ and Oehnell and Lindblom¹⁹ believed themselves to be the first to report visualization, by "air" shadows, of the biliary tract. Berg²⁰ in 1937 presented an interesting discussion of spontaneously occurring "gas" shadows in the hepatic region.

One other method of outlining the intrahepatic biliary tract should be mentioned: use of gallbladder dye. When an external biliary fistula has been pro-



Fig. 3 (patient M. N.).—Appearance after a barium sulfate meal twelve months later than that shown in figure 1. Most of the fistulous tract is now obliterated and only the portion of it arising out of the pyloric antrum could be demonstrated at this time. A, residue of the fistulous tract; B, the flat duodenal bulb.

Our second patient, S. K., brought in the stone pictured in figure 4, which she had passed in the feces several months previously during a very severe attack of pain with prolonged fever and jaundice.

21. Doubilet, Henry, and Colp, Ralph: Resistance of the Sphincter Oddi in the Human, *Surg., Gynec. & Obst.* 64: 622-633 (March) 1937.

22. Walters, Waltman; McGowen, J. M.; Butsch, W. L., and Knepper, P. A.: The Pathologic Physiology of the Common Bile Duct, *J. A. M. A.* 109: 1591-1596 (Nov.) 1937.

23. Dienst, C.: *Fortschr. a. d. Geb. d. Röntgenstrahlen* 41: 802, 1937.

6. Barsony, T.: Seltene Gallenblasenbefunde, *Fortschr. a. d. Geb. d. Röntgenstrahlen* 36: 759 (Oct.) 1927.

7. George, A. W., and Leonard, R. D.: The Pathological Gallbladder, in *Annals of Roentgenology*, New York, Paul B. Hoeber, Inc., 1922, vol. 2.

8. Schittenhelm, A.: *Lehrbuch der Röntgendiagnostik*, Berlin, Julius Springer, 1924.

9. Bertwistle, A. P.: *Descriptive Atlas of Radiographs*, St. Louis, C. V. Mosby Company, 1932.

10. Schinz, H. R.; Baensch, W., and Friedl, E.: *Lehrbuch der Röntgendiagnostik*, ed. 3, Leipzig, Georg Thieme, 1932, p. 1487.

11. Carman, R. D., and Miller, Albert: *Roentgen Diagnosis of Diseases of the Alimentary Canal*, Philadelphia, W. B. Saunders Company, 1917, p. 434.

12. Barclay, Alfred E.: *Digestive Tract*, New York, Macmillan Company; London, Cambridge University Press, 1933.

13. Henschen, K.: *Chirurgie d. Gallenwege*, Schweiz. med. Wchnschr. 51: 1222-1240 (Dec. 29) 1921.

14. Albrecht, H. U.: *Röntgendiagnostik des Verdauungs Kanals*, Leipzig, Georg Thieme, 1931.

15. Harrison, B. J. M.: *Textbook of Roentgenology*, Baltimore, William Wood & Co., 1936, p. 329.

16. Firor, W. B., in Waters, C. A., and Kaplan, I. I., editors: *The 1933 Year Book of Radiology*, Chicago, Year Book Publishers, Inc., 1933, p. 208.

17. Busi, Aristide: Radiologic Study of a Case of Cysticoduodenal Fistula, *Bollettino della scienze mediche* 7: 170, 1919.

18. Friedrich, L. V.: *Fortschr. d. Röntgenstrahlen* 39: 616 (April) 1929.

19. Oehnell, Harald, and Lindblom, K.: *Acta Radiol.* 10: 121, 1929.

20. Berg, Hans H.: Gas Filling of Bile Ducts, fifth International Congress of Radiology, 1937.

Her roentgenograms (figures 5 and 6) are more difficult to interpret but equally significant. The latter type of picture, without the air shadows however, is the most common in the literature when spontaneous internal biliary fistula is found by barium retroflux. Such complete visualization as that of our first patient is rarely obtained²⁴ and probably depends on a number of factors. The size of the aperture into the adjacent organ, the shape of the fistulous tract, the dilatation of the biliary ducts and bile pressures in the liver must be involved. Carman believed that his technic of gastric and duodenal roentgenology with avoidance of overdistention accounted for his failure to visualize the fistulas reported by Judd and Burden. The amount of pressure needed to secure retroflux into the bile ducts, either through an internal fistula or through the sphincter of Oddi, seems to vary considerably. In our first case no pressure and in the second case ordinary palpation pressures were sufficient. In the absence of internal fistula Venables and Briggs²⁵ and other roentgenologists have secured filling of the ampulla of Vater alone, presumably by ordinary pressures, and think this significant of bile tract or pancreatic disease if duodenal diverticulum and the persistent fleck of perforated duodenal ulcer can be ruled out. Reimann²⁶ reported filling

To one interested in the correct preoperative diagnosis of disease, the statement that "gastric symptoms sometimes predominate" is important. These patients as a rule have a prior history of long duration referable to the bile tract. An especially prolonged severe attack



Fig. 5 (patient S. K.).—Appearance of duodenum after barium sulfate meal. A, the somewhat irregular cap; B, a cap-shaped mass of barium sulfate arising from the first portion of the duodenum, which is probably a fistulous tract into what is left of the gallbladder, from which the stone shown in figure 4 had passed four months earlier. (Figure 6 shows a later view). Diverticula arising from this point at the tip of the duodenal cap would be extremely rare.

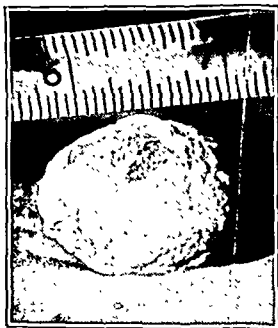


Fig. 4 (patient S. K.).—Gallstone passed by rectum during an especially severe attack of jaundice and pain four months before the roentgenograms shown in figures 5 and 6.

burst. Wichtl²⁸ reported that contrast substance passing through Vater's papilla outlined the biliary tract in a patient with duodenal ulcer, verified by operation.

It is possible to say that in our first case the fistula was between the stomach and the bile tract. The roentgenogram (fig. 3) taken twelve months after figure 1 shows a residue of it originating from the antrum near the pylorus and crossing the flat first portion of the duodenum. The remainder of the fistula, shown so well in figure 1, had been obliterated in the interval, probably because of removal of obstruction at the papilla of Vater (dislodgment of stone?). Fistulas between the duodenum and bile tracts are fifteen times more common than between the stomach and the bile tracts (Judd and Burden,³ Naunyn²). Since these fistulas are usually due to stone eroding through, it is also clear why the connection commonly occurs between the gallbladder itself and the duodenum, as seen in figure 5, rather than as in figure 1, which illustrates the rarer fistulas between the bile tract and the stomach.²¹

may then supervene, often with jaundice, sometimes as in our patient with vomiting of blood or bile with or without the passage of stone in gastric or fecal contents. The search for stone in the feces should not be omitted, as it is occasionally rewarded, even when the stones are small.²⁹ Perhaps more careful attention to these clinical points will insure an especially complete x-ray study including gallbladder and stomach and may



Fig. 6 (patient S. K.).—Appearance five hours after figure 5. B, the residue in what is probably the fundus of the gallbladder. Note the air shadow (negative) just above the barium sulfate. The fistulous tract is well shown, leading down toward the small residue in the duodeno-gastric region. The remainder of the barium sulfate has progressed well into the colon and fills it beyond the splenic flexure.

visualize a suspected fistula, either by barium sulfate or by air shadows. Symptoms tend to recur in these cases of biliary fistula, for when a stone is passed the infected gallbladder with or without further stones

Ans. Arch. Surg., Julius: Radiological Exploration of Some Unusual Fistulous Illnesses. M. J. 72: 534-535 (Dec.) 1937.
T. D., and Briggs, J. J.: Visualization of Bile Ducts in Human Nutrition. Fortsch. a. d. Geb. d. Röntgenstrahlen 41: 802, 1930.
W.: Arch. f. Exper. u. A.: Röntgenpraxis 4: 222 (March) 1932.
and Antopol (footnote): Röntgenpraxis 9: 559-562 (Aug.) 1937.

29. Ortmyer, Marie, and Austin, Margaret: Passage of Gallstones Through the Sphincter of Oddi, Am. J. Digest. Dis. 5: 411-413 (Sept.) 1938.

remains behind. If the fistula closes because the flow of bile from the common duct is no longer impeded, the seriously infected gallbladder may suppurate. Very rarely the formation of an internal biliary fistula effects a permanent cure. Perhaps no better statement can be made than that of Judd and Burden: "The mortality and morbidity of surgical diseases of the biliary tract, other things being equal, is directly proportional to the duration of symptoms. Formation of a spontaneous internal biliary fistula is in no sense a cure of cholelithiasis but an additional dangerous complication." Although the mortality in these complicated cases is probably ten times as high as with less seriously diseased gall tracts, the clinician and the surgeon are usually forced to consider operation with closure of the fistula, cholecystectomy and careful exploration of the ducts for stone.

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THE USE OF VITAMIN B₆ IN PSEUDO-HYPERTROPHIC MUSCULAR DYSTROPHY

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The finding of foci of muscle atrophy in vitamin B₆ deficient rats¹ and the production of tremors and convulsions in rats after the administration of massive doses of synthetic vitamin B₆² indicated that vitamin B₆ might have some effect on muscle action. Accordingly it was decided to determine whether 2-methyl-3-hydroxy-4,5-dihydroxy methyl pyridine (vitamin B₆) had any effect on the muscular dystrophies of man. This communication deals with six cases of pseudo-hypertrophic muscular dystrophy which were treated with the synthetic vitamin.

REPORT OF CASES

CASE 1.—A boy was first seen in February 1938 at the age of 4. For one year prior to this time his mother noted that he was reluctant to walk, walked unsteadily requiring a wide base, fatigued easily on walking and had difficulty in rising from a supine position. In January 1939 he had to pull himself upstairs by sheer arm strength on the banister. At this time his calf muscles were becoming definitely larger. Aminoacetic acid and ephedrine therapy had no effect. During this period of observation the symptoms were slowly and progressively increasing. In October 1939 vitamin B₆ was administered subcutaneously in 10 mg. doses at intervals of from four to seven days. In three weeks he was able to walk up two stairs without the help of his hands, and his gait was normal. In one month he was able to walk up an entire flight of ten steps, one at a time, without the use of his hands when he started off with his right foot, and he could rise from a supine position with agility. When sterile injections of physiologic solution of sodium chloride were substituted for the vitamin B₆ there was a partial relapse after a week and a half. After reinstitution of vitamin B₆ therapy (from 100 to 250 mg. subcutaneously each week) improvement was again noted. At present (Jan. 4, 1940) his gait is entirely normal; he rises from the supine position as well as a normal child and runs with slight difficulty.

CASE 2.—A boy aged 11 years, a brother of patient 3, developed a lordosis and a waddling gait at the age of 6 years. He had received aminoacetic acid for eighteen months and prostigmine for four months without any effect. When he first came

under our observation, for vitamin B₆ therapy, Nov. 7, 1939, he could climb stairs by pulling on the banister with two hands or with one hand on the banister and one on his knee. He could rise only to his knees, from a supine position. All his muscles were weaker in flexion than in extension. He was given a total of 680 mg. of vitamin B₆ subcutaneously during the course of one month, at intervals of from four to eight days. During this period the lordosis decreased, his walk improved, his grip was firmer and he rose from the supine to the erect position with agility. He was maintained on from 100 to 500 mg. of vitamin B₆ subcutaneously at weekly intervals. At present (Jan. 7, 1940) he rises from the floor more rapidly and with less effort, his walk is considerably improved, waddling is less pronounced and his grip is stronger. The patient complains less of fatigue on walking.

CASE 3.—The brother of patient 2, aged 13 years, who was markedly obese, weighing about 200 pounds (91 Kg.), had even more advanced impairment of muscular action. His appearance corresponded to that of the glandular type of pseudohypertrophic muscular dystrophy. At 5 years a wide gait, a tendency to limp and lordosis developed. He was barely able to walk. Aminoacetic acid for eighteen months and prostigmine for four months were administered without any effect. The muscles were large and doughy. He received the same vitamin B₆ treatment as his brother and in one month he was able to rise from a chair with only slight difficulty and walked more steadily. The improvement has been progressive and at the present time (Jan. 7, 1940) the strength in his arm is improved both in grip and in flexion power, he can rise from a chair with still greater ease and speed and his walk is more steady.

A third and younger brother, who has a mild form of muscular dystrophy, was given no treatment during this period and showed no improvement in his symptoms.

CASE 4.—A man aged 43 had for twenty years noted a weakness with gradually progressive inability to walk upstairs without pulling himself up by the handrail. At present the weakness also involves the trunk muscles and those of the upper extremities. Ephedrine and aminoacetic acid over a period of six months had no effect. On examination Dec. 16, 1939, the patient exhibited marked lordosis and a waddling gait. He was unable to raise either arm to the horizontal position without the assistance of the other. He could climb stairs only by pulling himself up with the aid of his hands and a wide, sloping posture. He could rise from the chair only when he had a stool on which to brace himself. Aminoacetic acid and ephedrine therapy were continued. Three hours after the subcutaneous administration of 50 mg. of vitamin B₆ he was better able to rise out of a chair. He noted greater ability in performances, especially in climbing inclines, in rising and in dressing himself. Five days later he could raise his arms 15 degrees in the horizontal plane without assistance and, in addition, was now able to hold this position. He stood more erect and rose out of a chair with less assistance of his hands. The following week 150 mg. of vitamin B₆ was given subcutaneously and in six days the patient discarded his cane, since he could get along without its aid. He could now raise his arms much higher, almost touching the midhumeral level of one arm with the fingers of the other. He could also button his collar without effort. Three hundred mg. of vitamin B₆ was given subcutaneously at this time and about a week later he could touch his shoulder with the fingers of the other arm. His posture was less lordotic, he could walk with even greater agility, dress himself with minimal trouble and rise from the chair with very little help.

CASE 5.—A boy aged 16 had progressive weakness of the muscles of the shoulder girdle, which had been noted for five years. On his first visit the patient wore an elaborate brace to keep his shoulders from drooping and to aid him in elevating his arms. He could elevate his arms through about 75 degrees before it was necessary for him to use the accessory muscles of the neck for further elevation. Within a half hour after the administration of 50 mg. of vitamin B₆ intravenously he could elevate his arms through twice the distance and require only much less use of the accessory muscles to elevate them. He was given 100 mg. of vitamin B₆ at weekly intervals, at which time the so pronounced that the patient discarded his

From the Division of Laboratories, the Newark Beth Israel Hospital.
1. Antopol, William, and Unna, K., to be published.
2. Unna, K., and Antopol, William: *Proc. Soc. Exper. Biol. & Med.*, to be published.

could now elevate his arms to the perpendicular position with minimal accessory use of his neck muscles. The patient returned to school and no further treatment has been administered. Two weeks after the last administration of treatment he writes that he has never felt better and sees no need for the use of a brace.

CASE 6.—A girl aged $8\frac{1}{2}$ years developed a peculiar walk with lordosis and some waddling after an attack of whooping cough at the age of 2 years. About six years later she began to have trouble walking upstairs. At first it was necessary to pull herself up by the banister, and for the last year it was necessary for her to use her hands and her knees in order to push herself up the steps, and this was accomplished only with very great effort. At this time it was also noted that she had considerable trouble in rising from the supine position. In the past six months she had not been able to get up to the erect position. One hundred mg. of vitamin B₆ was given at weekly intervals for two weeks, after which time the child could rise from the supine position to a fully erect one with moderate difficulty only. A week after the administration of another 100 mg. of vitamin B₆ she could walk downstairs with alternate feet for the first time in over a year. The hand grip by this time was improved. Since that time, despite intensive therapy, not only has she failed to improve, but her condition has become worse.

COMMENT

Since vitamin B₆ is a newly synthesized compound, its pharmacologic action has not been sufficiently investigated, and its effects can be accounted for only theoretically. It is known that pyridine in its action resembles coniine and piperidine, except that pyridine does not cause paralysis of the ganglion. It might be assumed that vitamin B₆, which is a pyridine derivative, has an enhanced pyridine stimulating effect. In support of this contention it has been found that large doses of vitamin B₆ produce muscular spasms and convulsions in rats.³ Spies and his co-workers⁴ also noted increased muscle strength in patients with vitamin deficiency after the administration of vitamin B₆. It must also be considered that this compound may aid in the production of the respiratory enzyme containing the pyridine structure which is involved in muscle metabolism. His⁴ made the interesting observation that pyridine injected into dogs is converted to its methyl derivative. It is not to be implied that this group of muscular dystrophies are due to avitaminosis B₆.

No untoward effects were observed in any of the patients receiving the compound. The effect of this compound on the adrenal cortex is under investigation, since it produces changes in this organ.⁶ Aside from the hypodermic route, injection and oral administration are being tried. The effects of vitamin B₆ on nyctsthenia gravis and other forms of muscular derangement and weakness are under investigation.

In view of the promising results with the cases of pseudohypertrophic muscular dystrophy, though the patients have not been cured and are still under treatment, this form of therapy is being studied further and is also being investigated in conjunction with other vitamins, particularly E and riboflavin, and with amino-cetic acid and ephedrine.

SUMMARY

1. Vitamin B₆ was used in six cases of pseudohypertrophic muscular dystrophy with considerable improvement in their condition.

2. No untoward symptoms were observed in any of the cases.

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3. Spies, T. D.; Bean, W. B., and Ashe, W. F.: Note on Use of Vitamin B₆ in Human Nutrition, *J. A. M. A.* **112**: 2414 (June 10) 1939.
4. His, W.: *Arch. f. Exper. Path. u. Pharmacol.* **22**: 253, 1937.
5. Urich and Antopol (footnotes 1 and 2).

HISTAMINASE IN THE TREATMENT
OF COLD ALLERGY

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For several years Horton, Brown and Roth¹ have studied the interesting phenomena exhibited by patients suffering from cold allergy or a hypersusceptibility to cold. They have demonstrated that the systemic reactions, behavior of the blood pressure, pulse rate and gastric acids of these patients when exposed to cold are in every way comparable to the symptoms experienced by persons who have received injections of histamine hydrochloride. Similar local reactions in the hand may be reproduced by the intra-arterial injection of 0.5 mg. of histamine. These workers have concluded that physical agents such as cold probably cause increased permeability of the tissue cells and permit the release of histamine, which is a normal constituent of the skin and other organs, thereby causing the phenomena manifested by patients exhibiting hypersensitivity to cold. Since the work of Dale² on the chemical transmission of nerve impulses by acetylcholine, it was suggested that the liberation of acetylcholine might be responsible for the phenomena shown by patients with cold allergy. This suggestion has now been disproved.

In 1931 Best and McHenry³ demonstrated that histamine was destroyed in the body by an enzyme called histaminase. This enzyme was found to be present in relatively large amounts in the wall of the large and small intestine and in moderate amounts in many other organs.

Histaminase is now prepared commercially.⁴ According to the manufacturers it is a protein-like material derived from the intestinal mucosa and is said to be destructive to histamine and histamine-like substances. It is prepared in enteric coated tablets, each representing five histamine detoxicating units, or in ampules, each dose being equivalent to two histamine detoxicating units. One unit represents the quantity of histaminase which is capable of detoxifying 1 mg. of histamine hydrochloride during twenty-four hours at 37 C. It was therefore logical that histaminase should be tried in cases of cold allergy, which in all probability is caused by its antagonist, histamine.

The first case of cold allergy successfully treated with histaminase was reported by Roth and Horton¹ in 1937. It was my privilege to be associated with these workers, and naturally I have been on the alert for similar cases. Hypersensitiveness to cold is supposed to be an extremely rare condition, and most of the reported cases have involved patients from the Northern and Northwestern states; however, during the past

1. The work has been described in the following articles:
Horton, B. T.: Cold Allergy, *Proc. Staff Meet., Mayo Clin.* **2**: 276-277 (Nov. 23) 1937.
Horton, B. T., and Brown, G. E.: Histamine-Like Effects on Gastric Acidity Due to Cold, *ibid.* **7**: 367-371 (June) 1932.
Horton, B. T.; Brown, G. E., and Roth, Grace: Hypersensitiveness to Cold with Local and Systemic Manifestations of a Histamine-like Character: Its Amenability to Treatment, *J. A. M. A.* **107**: 1263-1269 (Oct. 17) 1936.
Horton, B. T., and Roth, Grace: Collapse While Swimming: The Most Dangerous Consequence of Hypersensitiveness to Cold, *Proc. Staff Meet., Mayo Clin.* **12**: 7-11 (Jan. 6) 1937.
Roth, Grace, and Horton, B. T.: Hypersensitiveness to Cold: Treatment with Histamine and Histaminase; Report of Case, *ibid.* **12**: 129-134 (March 3) 1937.
2. Dale, Henry: Chemical Transmission of the Effects of Nerve Impulses, *Brit. M. J.* **1**: 835-841 (May 12) 1934.
3. Best, C. H., and McHenry, E. W.: Histamine, *Physiol. Rev.* **11**: 371-477 (Oct.) 1931.
4. The supply of histaminase, called T-360, or Torantil, was furnished by the Winthrop Chemical Company, Inc.

year of private practice I have observed two definite cases of cold allergy. It is my belief that the condition will be found not such a rarity as it seems, once the index of diagnostic suspicion is increased, and that it is not necessarily indigenous to the colder climates. Both of these patients were successfully treated with histaminase.

REPORT OF CASES

CASE 1.—History.—A married woman aged 68, first seen in September 1938, had usually enjoyed excellent health prior to February of that year. There had been no serious medical or surgical illnesses. She was not aware of the presence of hypertension until this examination.

In February, while kneading dough with cold milk, her fingers and hands became painful and swollen so that the hands could not be closed. The fingers were blanched, while the hands were livid red. The pain and color changes disappeared after ten minutes but the swelling persisted for six hours. Since the first experience, the immersion of the hands in cold water or exposure to cold had produced similar reactions. A severe generalized headache, palpitation and general tremulousness often accompanied the reactions but usually subsided with the onset of localized edema.

The hands were not alone susceptible. Areas of erythema and edema would develop in other parts of the body when exposed to cold. Cold air would produce numbness and tingling of the face with occasional swelling of the lips and eyelids so that the patient used a protective wrap around her face even in the summer. Cold drinks would precipitate an irritative cough and edema of the lips and tongue so that speech was difficult. These reactions would occur on the warmest days of summer. She was very careful never to remove her dental plates from cold water because of the swelling of the gums when the teeth were placed in her mouth. For months she had taken olive oil baths and it was necessary to heat the bedclothes before retiring to prevent pruritus and generalized paresthesias. The sensation of cold was never appreciated as cold but as a burning paresthesia. Other symptoms of her sensitivity to cold have occurred but are too space consuming to detail here.

There had been no hemoglobinuria with any of the attacks, a phenomenon not infrequently observed when these patients are subjected to severe cold. There was no history of pollen

The pulse and temperature were normal. The blood was 182 mm. of mercury systolic, 90 diastolic. There was an immature cataract in the right eye, preventing a satisfactory ophthalmoscopic examination. The fundus of the left eye was normal save for a moderate degree of sclerosis of the arteries. The heart was apparently normal except for occasional ventricular premature contraction. The lungs were clear. The abdomen and pelvis were essentially normal.

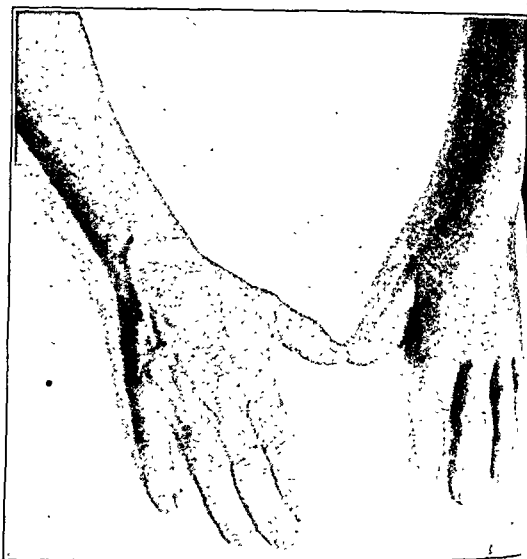


Fig. 2 (case 1).—Appearance of left hand after it had been immersed in water at 10 C. for five minutes. The hand was less swollen and changes less marked than on previous occasions.

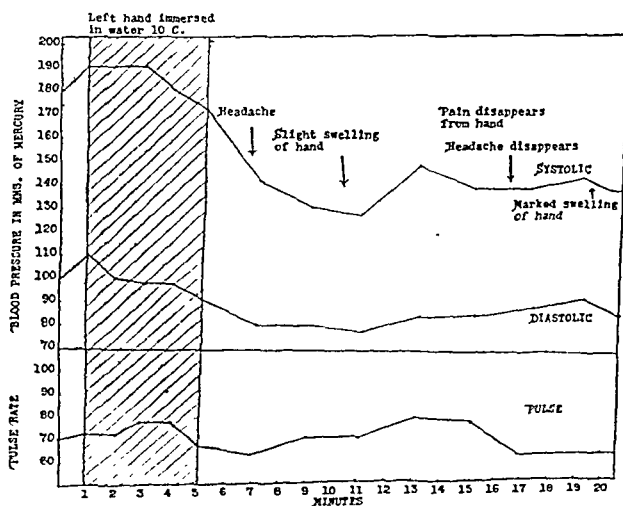


Fig. 1 (case 1).—Observations on the blood pressure and pulse rate when the left hand was immersed in water at 10 C. for five minutes. The appearance of certain symptoms after cessation of the test is correlated with these observations. The patient has mild essential hypertension.

sensitivities, food and drug idiosyncrasies or other allergic manifestations. An inventory of symptoms by systems did not reveal any additional significant facts. The family history, marital history and past medical history were irrelevant.

Physical Examination.—The patient was remarkably active and alert for her years. She weighed 120 pounds (54.5 Kg.).

for retroversion of the uterus. The presence of Heberden's nodes and deformities of the digits gave evidence of osteoarthritis. There was moderate sclerosis of the peripheral arteries. All the peripheral pulsations were present. Reflexes were normal. There were no cutaneous lesions.

The Kline and Wassermann serologic reactions of the blood were negative. The hemoglobin determination was 71 per cent by the Sahli method. The red blood cells numbered 4,400,000 and the white blood cells 6,450 per cubic millimeter, with a normal differential count. There was no morphologic abnormality of the erythrocytes.

It was evident that the patient was probably suffering from a hypersensitivity to cold. This was soon confirmed by a simple procedure. Cold water was poured over both hands and the distal half of the forearms. Within two minutes the hands and the forearms became livid red, the changes sharply confined to the areas which were in contact with the cold water. The fingers, however, were extremely blanched and presented a sharp contrast to the purplish red of the hands. There was no diminution in the pulsation of the radial artery. The involved parts became very painful. The pulse rate accelerated and the patient complained of a generalized ache. After about ten minutes the headache, tachycardia and color changes subsided but coincidentally with this the swelling of the hands became so marked that she could not close her hands. The swelling involved only the parts which were placed in the cold water and ended abruptly at the wrists. There was also some slight swelling and edema of the lips. The edema gradually subsided within the next twenty-four hours. This procedure was repeated for the satisfaction of other observers but each time the results were less dramatic.

Seven days later, more detailed studies of the patient's blood pressure and gastric acids were made. The standard test for sensitivity to cold described by Horton and Roth was employed. Briefly, it is described by these authors as follows: "The hand is immersed in ice water at 10 C. (50 F.). After removal of the hand into ice water, observations on pulse rate and blood pressure are made and observations are made at intervals while the hand is in the water and at the end of twenty minutes after the hand is removed from the water."

water. If swelling of the hand occurs after it has been removed from the water, the indication is that the patient is sensitive to cold. This test should not be confused with the 'cold test' for essential hypertension."

The observations on the case herein reported are summarized in figure 1. The most significant drop in blood pressure occurred shortly after the hand was removed from the cold water. This was confirmed by a repetition of the test. The time of appearance and cessation of certain clinical symptoms and signs are also noted in figure 1. The localized edema of the hands (figs. 2 and 3) persisted for about eighteen hours after this test.

An attempt was made to repeat the studies made on the gastric acids by Horton and Brown.¹ They found a striking similarity between the acidity curves produced by the tests just described and those produced with histamine stimulation. A stomach tube was introduced prior to the cold water test. No free hydrochloric acid was present; however, after the test another gastric specimen was examined and this revealed 8 units of free hydrochloric acid. Unfortunately the gastric analysis could not be repeated after histamine stimulation.

Treatment.—Two methods of treatment were employed: (1) gradual desensitization to cold and (2) histaminase therapy. The course of treatment required five weeks. During the first week the hands were immersed in ice water, 10 C., twice daily for one minute; during the second week the time of immersion was increased to two minutes twice daily and so on until the fifth week, when the hands were immersed for five minutes twice daily. The patient was instructed not to increase the time of immersion if severe reactions occurred. Fortunately this was not necessary and the program as outlined was followed successfully. The water temperature was regulated by a bath thermometer.

Histaminase tablets were used simultaneously. Each tablet contained five histamine hydrochloride detoxifying units. Two tablets were given orally for the first two days and thereafter three tablets were administered daily, so that 103 tablets, or 515 units, were used during the five weeks of therapy. No subjective or objective signs of toxicity to the drug were observed.

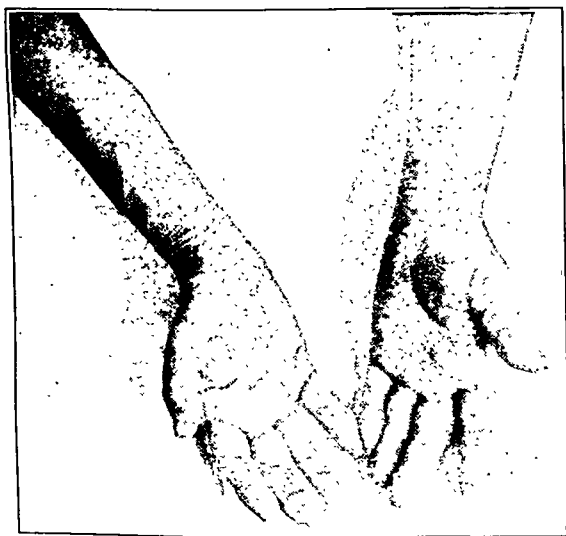


Fig. 3 (case 1).—Front view of hands shown in figure 2.

The results of the treatment were most gratifying. It became possible for the patient to do her laundry and to use cold water indiscriminately with no reactions resulting. However, following bronchopneumonia in January 1939 a slight swelling of the hands returned with exposure to cold. She was again given one tablet of histaminase daily for twenty days. There has been no return of her symptoms. Recent correspondence, nine months later, states that the patient is enjoying excellent health and no longer fears exposure to cold.

The second case was similar in many respects and is therefore not reported in detail.

CASE 2.—A married woman aged 26 had usually enjoyed excellent health. In the summer of 1932 during the very hot weather she allowed water from melting ice to drop on her face for several minutes. Within a few minutes she noticed edema of the face accompanied by a stinging sensation. Shortly after the initial incident she observed swelling and pallor of the hands when she held a glass containing a cold beverage. At times merely placing her hands in the refrigerator to remove food would cause an urticarial reaction of the hands. The following winter, exposure to cold for brief periods would cause swelling, reddening and pruritus of the face and neck. Prolonged exposure would cause edema and a mottled appearance of the lower extremities. She avoided cold baths and swimming because they always produced a "checker-board mottled appearance of the skin." These symptoms had persisted for seven years before treatment was begun. No hemoglobinuria had been noted.

The physical examination showed essentially normal results throughout. Treatment was instituted in the same manner as that employed in the first case except that only two tablets of histaminase were taken daily. A total of about 300 units of histaminase was given to this patient over a period of thirty days.

Again rather dramatic results were obtained. It is now possible for her to handle ice and disregard cold without untoward results. During a recent vacation, ocean bathing was enjoyed with no discomfort.

COMMENT

Three methods for the treatment of cases of hypersensitivity to cold have been previously recommended: (1) subcutaneous injections of 0.1 mg. of histamine twice daily for two to three weeks, (2) systemic desensitization to cold as described in this report, (3) the oral use of histaminase. The latter methods appeared more practicable for several reasons and were therefore jointly employed in the two here reported. In the first case, histaminase was successful when used alone in treating a mild reaction, even though it was given in small doses. I have no clinical experience with the intramuscular use of histaminase. It would be interesting to know ameliorating effects a single injection might have on the acute manifestations of cold allergy, whether naturally or experimentally induced.

Histaminase is now being employed in the treatment of several conditions of an allergic nature. Foshay and Hagebusch⁵ have reported excellent results from the use of histaminase in serum sickness. Roth and Rynearson⁶ have recently reported interesting observations of its use in the treatment of allergic reactions to insulin. I propose to make a clinical trial of histaminase in the treatment of migraine. A wider application of this drug is suggested, particularly in allergic diseases and especially in those conditions in which urticaria is a prominent feature.

SUMMARY

Two patients with cold allergy, or hypersensitivity to cold, were successfully treated by the combined use of histaminase and a method of systemic desensitization to cold. The use of histaminase for allied conditions is suggested.

119 West Seventh Street.

5. Foshay, Lee, and Hagebusch, O. E.: Histaminase in Serum Sickness. *J. A. M. A.* 112: 2398-2402 (June 10) 1939.
6. Roth, Grace M., and Rynearson, E. H.: The Use of Histaminase in the Treatment of Allergic Reactions to Insulin. *Staff Meet., Mayo Clin.* 14: 353-358 (June 7) 1939.

CONCENTRATED HUMAN BLOOD SERUM AS A DIURETIC IN NEPHROSIS

FURTHER OBSERVATIONS

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AND

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In July 1938 Aldrich, Stokes, Killingsworth and McGuinness reported the results from treatment of nine patients with pure lipoid nephrosis by intravenous injection of concentrated pooled human serum. In this paper it was shown that, while some of the responses were spectacular and apparently curative, others were disappointing.

It is our purpose in this paper to record further experiences with seven additional patients and to tabulate the results not only for these patients but also for the previously recorded nine. In this way it is hoped that some more definite indications for using this method may be found.

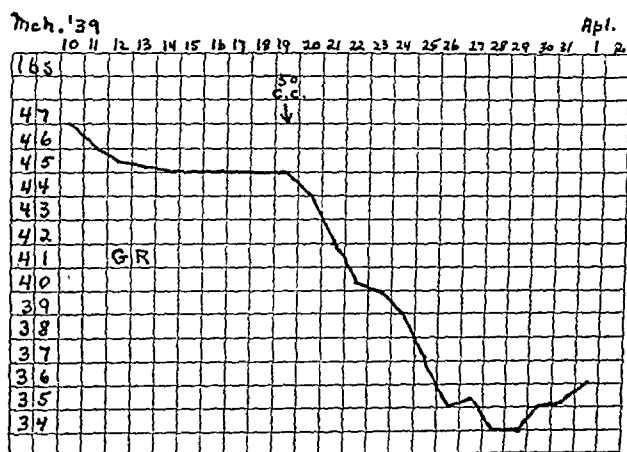


Chart 1 (case 1).—Complete diuresis following intravenous injection of 50 cc. of four times concentrated serum. Complete recovery ensued.

We are including all the patients with pure nephrosis whom we have seen during the intervening period and in addition are tabulating two additional case reports furnished by Dr. Joseph Stokes Jr., of Philadelphia. Treatment with the serum was instituted as soon as feasible in every case. An initial dose of from 25 to 65 cc. of the four times concentrated serum was administered intravenously, and if diuresis did not follow within two or three days another injection was made. The maximum number of treatments necessary in any one attack of edema was four, and in most instances one or two were sufficient. In one instance, as a matter of experiment (case 6), several smaller injections (10 cc.) were made on several succeeding days. This method, however, did not appear successful and has not been repeated.

In addition to the present study, serum was given to many patients with other types of renal edema, but the results were disappointing. In fact, so regular has been the favorable response with nephrotic patients, and so infrequent the diuresis in other types of renal edema, that we have come to look on the response

to serum as a fairly accurate method of differentiation. Whenever an appreciable number of red blood cells were demonstrable in the urine, diuresis did not follow.

PREPARATION OF SERUM

In the cases reported in 1938 the serum used was furnished by the Philadelphia Serum Center, and that material was used in cases 1 and 2 of this series. The other patients were given serum prepared in Chicago in the following manner: Blood was drawn from voluntary donors in the outpatient department of the Children's Memorial Hospital.¹ This was then turned over to the Samuel Deutsch Serum Center for separation of serum and pooling, after which it was sent to Northwestern University Medical School for dehydration, approximately as done by Flosdorf and Mudd. After this process it was again sent to the Serum Center for sterility tests before use. (It should be mentioned that whereas in the last year's group filtering after dehydrating to remove large fat globules was considered necessary, further experience has demonstrated that this precautionary measure can be safely eliminated.) The serum finally produced comes to us as a reddish yellow powder in tubes with a rubber stopper. Each tube is marked with the number of cubic centimeters of original serum from which it was obtained. In diluting this for injection, it is necessary merely to thrust a needle through the stopper and introduce one fourth the original liquid measure of sterile water. If desired, homologous serum can be used to obtain a five times concentration. Drs. S. A. Levinson, C. J. Farmer, W. P. Killingsworth, L. L. Braun and other assistants cooperated in preparing this material for experimental work without compensation.

REPORT OF CASES

In the following case reports we shall, for the sake of brevity, eliminate notations as to albuminuria, blood in the urine, blood chemical estimations, blood pressure and edema. All the patients had (1) marked generalized edema, (2) large amounts of albumin persistently in the urine and (3) no red cells in any of the urinary sediment examined. (Enough red cells to cause a positive benzidine test on the centrifuged sediment ruled out the diagnosis of nephrosis.) All had normal blood pressure, normal nonprotein nitrogen and blood urea nitrogen estimations, increased blood cholesterol and marked decrease in the serum proteins with a reversal of the albumin-globulin ratio.

CASE 1.—G. R.,² a boy aged 4 years, was admitted to the Abington Memorial Hospital March 10, 1939. March 7 both legs and ankles became swollen. The next day the abdomen, scrotum and penis increased in size. The face did not change, but the patient had a poor appetite and was weak. The physical examination revealed nothing unusual but generalized edema. The face became more edematous in a few days, and the apathy increased.

March 19 he was given 50 cc. of four times concentrated serum intravenously, following which there was a sharp febrile reaction, the temperature rising to 106 F. This reaction subsided by the next morning, at which time diuresis set in. The boy lost 11 pounds (5 Kg.) and all of his edema in nine days. The albumin was reduced to a mere trace by April 1 and on May 1 was reported to be negative.

Case 1 illustrates complete diuresis with one dose of 50 cc., followed by complete recovery.

1. It is worthy of more than passing notice that no difficulty was encountered in getting the parents and relatives of our ward patients to donate blood as a mark of appreciation for the care their children were receiving.

2. Case report furnished by Dr. Joseph Stokes Jr., Philadelphia.

CASE 2.—S. C.,² a Negro boy aged 3 years and 2 months, was admitted to the Children's Hospital of Philadelphia Jan. 3, 1938. Three days previously his eyelids were swollen on awakening.

On admission there were marked generalized edema, a temperature of 100.6 F. which immediately fell to normal, and no other abnormality.

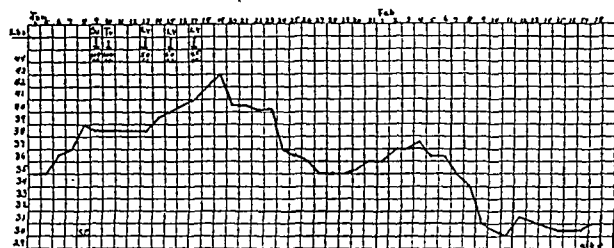


Chart 2 (case 2).—Complete diuresis following three injections of 50, 50 and 25 cc. of four times concentrated serum. Complete recovery took place.

January 9 he was given 105 cc. of a 50 per cent sucrose solution intravenously. January 10 100 cc. of citrated blood was administered. There was no loss of weight. He was then given three injections of four times concentrated serum; 50 cc. January 13, 50 cc. January 15 and 25 cc. January 17. Two days later a prolonged diuresis of three weeks began, in which he lost 13 pounds (6 Kg.) and became edema free. The albumin then disappeared from the urine, and he is at the present time entirely well.

Case 2 illustrates complete diuresis after concentrated serum therapy, with prompt recovery from all signs of nephrosis.

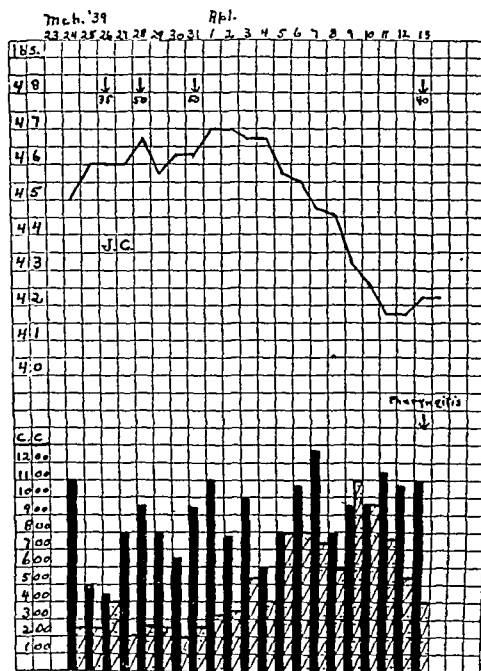


Chart 3 (case 4).—Incomplete diuresis following three injections of 35, 50 and 50 cc. of four times concentrated serum. The interruption was due to lessened urinary output with the onset of pharyngitis. The patient eventually succumbed.

CASE 3.—J. R., a girl aged 3 years, was admitted to the Children's Memorial Hospital Nov. 9, 1937, with a history of generalized swelling for the last four months.

After a period of observation during which she gained 3 pounds (1.3 Kg.), she was treated with 30 cc. of four times concentrated serum November 22 and with 40 cc. November 30. With the first injection there was a sharp febrile reaction

lasting a few hours only. Diuresis began the day after the first dose of serum, apparently stopped on November 26 and was reinstated after the second dose, after which it went on to completion.

CASE 6.—D. B., a boy 2 years and 9 months old, entered the Children's Memorial Hospital July 30, 1938, with the history that he had been swollen for four months. There was no known antecedent illness. Physical examination showed normal status except for generalized edema.

The patient's course in the hospital is reflected by a wave-like weight curve with alternating ascents and declivities, some

TABLE 1.—The Effect of Treatment in the Present Series of Cases

Case	Time Before Treatment	Dosage, Cc.	Effect on Urinary Output	Amount of Albumin at Present
1	12 days	50	Complete diuresis	0
2	13 days	50, 50, 25	Complete diuresis	0
3	13 days	30, 40	Complete diuresis	0
4	14 days	35, 50, 50, 40	Incomplete diuresis	Death, septicemia
5	6 wk.	25	Complete diuresis	4 plus (under treatment)
6	4 mo.	35, 25 45 35, 35, 70, 70 25, 25, 25, 25 10 daily (15 doses)	Complete diuresis Complete diuresis Complete diuresis Complete diuresis Questionable result	Trace to 1 plus
7	6 mo.	40, 50, 25 25, 25	Complete diuresis Complete diuresis	

of which can be accounted for by "colds" and some of which are unexplained. On at least four occasions complete diuresis was apparently initiated by intravenous administration of concentrated human blood serum. At one time (Dec. 29, 1938, to Jan. 15, 1939) repeated small 10 cc. injections were given daily during a period of increasing weight with no effect whatever on the edema. January 29 the child became desperately ill with peritoneal symptoms, recovering by crisis after 100 cc. of convalescent scarlet fever serum was administered. During the convalescence from this attack, however, a testicular abscess developed which was drained surgically February 19. A pure culture of pneumococci was grown from the pus and he was treated intradermally with a filtrate from this growth. After this episode his weight reached its lowest, 27 pounds (12 Kg.). Mumps developed March 3 with no complications. After chickenpox a few weeks later he had another peritoneal attack and was treated with convalescent scarlet fever serum and sulfapyridine, after which he lost all his edema. The patient has recently undergone a relapse and is under treatment again.

TABLE 2.—Present Status of Sixteen Patients, in Order of Time Elapsed Before Treatment with Serum

Case	Time Before Treatment	Amount of Albumin at Present	Last Observation
G. R.	12 days	0	Symptom free
S. C.	13 days	0	Symptom free
A. M.	14 days	0	Symptom free
J. C.	16 days	.....	Death, sepsis
C. P.	21 days	0	Symptom free
N. T.	4 wk.	.....	Death, sepsis
G. P.	4 wk.	0	Symptom free
W. A.	6 wk.	4 plus	Under treatment
M. Y.	6 wk.	0	Symptom free
J. R.	4 mo.	0	Symptom free
D. B.	4 mo.	3 plus	Under treatment
G. B.	5 mo.	1 plus	Symptom free
J. A.	6 mo.	0	Symptom free
J. F.	3 yr.	.....	Death, sepsis
F. M.	4 yr.	.....	Death, renal insufficiency
A. C.	4 yr.	.....	Unknown status

Case 6 illustrates the repeated diuretic effect of concentrated serum in large doses and its ineffectiveness in small, often repeated doses. In this boy edema recurred in spite of repeated complete diureses. He is at present convalescent.

CASE 7.—J. A., a girl aged 1½ years, was admitted to the Children's Memorial Hospital Jan. 22, 1939, with a history of neralized swelling for six months. She had been treated

during part of this time for an allergic condition, and the edema had disappeared and returned in a recent wave.

Physical examination showed normal conditions except for the edema, which was generalized. However, during the next few days there developed a streptococcal sore throat with otitis media and a moderately high fever, which subsided in about one week.

The patient was given concentrated serum on January 25 (40 cc.) and on January 29 (50 cc.). During this period the weight curve rose, but diuresis began February 3, at about the time when the temperature became normal. She became edema free February 9 and was given another dose of 25 cc. of serum February 15. Albuminuria persisted. She returned to her home in West Virginia, where she contracted influenza and went through another bout of moderate edema. Subsequently she had another major episode and was successfully treated with two injections of 25 cc. of concentrated serum. Complete diuresis followed and the albumin disappeared. At the present time she is completely well.

Case 7 illustrates the delayed response or absence of response to concentrated serum in the presence of an infectious process, as well as the diuresis often seen after fevers.

COMMENT

These reports and table 1 demonstrate that the treatment usually appeared effective, as diuresis and weight loss followed the serum administration and

TABLE 3.—End Results in Sixteen Cases

Status	No. of Cases
Symptom free.....	9
With albuminuria.....	1
Edematous, under treatment.....	2
Unknown.....	1
Death.....	4

TABLE 4.—Results with Nine Patients Treated Less Than Six Weeks After Onset

Status	No. of Cases
Complete recovery.....	6
Edematous, under treatment.....	1
Death.....	2

as in most instances the diuresis, when once initiated, went on to complete elimination of edema fluid without additional serum. Why it is that some of these patients proceeded to complete recovery and lost the albuminuria and others went on to show long continued urinary abnormalities and repeated attacks of edema, we are at a loss to explain. However, it is evident that complete recovery was much more frequent in the early stages (table 2).

In table 2 the patients described in last year's report and in the present paper are grouped together according to the time which elapsed between the first known symptoms and the first injection of serum. This shows clearly the relatively good prognosis for those with recent onset (tables 3 and 4). Of the nine treated before six weeks had elapsed, six were completely well when last observed and two more were still under treatment. This suggests that, in order to be most effective, this method should be applied early rather than as a last resort.

In the previous report the evidence suggested that concentrated serum might be ineffective when administered in the presence of an acute infectious process. In this series this impression has been borne out (cases 6 and 7). For this reason, wherever possible we wait

until all manifestations of an acute infection have subsided before injection. This has the added advantage that it gives a chance for spontaneous diuresis to occur if it is going to take place and decreases the possibility that in this series we have attributed such spontaneous diuresis to a serum effect.

In some clinics, reactions have been disturbing. It has been our observation that severe febrile elevations have happened only when the serum shows considerable hemolysis. We think that rapid handling of the blood to separate the serum before much hemolysis has had a chance to take place will eliminate this difficulty. The serum should be distinctly yellow, not red. In the present series none of those treated with the Chicago serum had any alarming reactions.

The mechanism which initiates the diuresis remains unknown. It is certain that it is not due solely to increase in the blood serum proteins, for they have not been significantly elevated for any prolonged period. It is conceivable that the injected serum, being water thirsty, may act as a continuous conveyor of water from the tissues to the kidneys. But we are impressed most of all with the similarity between these diureses and the spontaneous renal crises. These responses look as though in some way the serum had supplied the necessary material to make this natural process possible.

It should be noted that this method has uniformly produced the diuretic effect only in patients whose urine has never shown red blood cells. This fact suggests that the pathogenesis of hematuric types of edema is not similar to that of pure nephrosis.

SUMMARY

Seven additional patients with pure nephrosis were treated with four times concentrated pooled human serum.

Diuresis usually occurred in these patients and went on to complete elimination of edema fluid as a rule, sometimes to complete recovery from the nephrosis.

Patients with other types of renal edema, notably those with any hematuria, were not benefited.

When the cases first reported in the present paper were listed, together with nine cases reported in 1938, according to the elapsed time between first symptom and first treatment with concentrated serum, it became evident that those treated earliest had a much more favorable subsequent course. This suggests that this method should be used by first choice rather than as a last resort.

Reactions were insignificant unless hemolysis had occurred in the serum. This is shown by its being definitely red.

If the patient showed evidence of acute infection, the serum was ineffective.

723 Elm Street—2376 East Seventy-First Street.

Etiology of Chilblain.—In addition to exposure to cold, there is also a constitutional factor in the development of chilblain. The condition usually affects individuals with anemia and poor muscle tone. It is particularly common in children and young women who have a low basal metabolic rate or ovarian hypofunction. There seems to be avascular instability which is more appreciable in youth and which gradually improves with the years. Peripheral circulatory disturbances also play a role. A tight shoe will tend to increase the frequency of the occurrence; a stocking that is too small can act in a similar way. Direct pressure on the skin causes local anemia and venous stasis is frequently seen in connection with the chilblain. —Hauser, Emil D. W.: *Diseases of the Foot*, Philadelphia, W. B. Saunders Company, 1939.

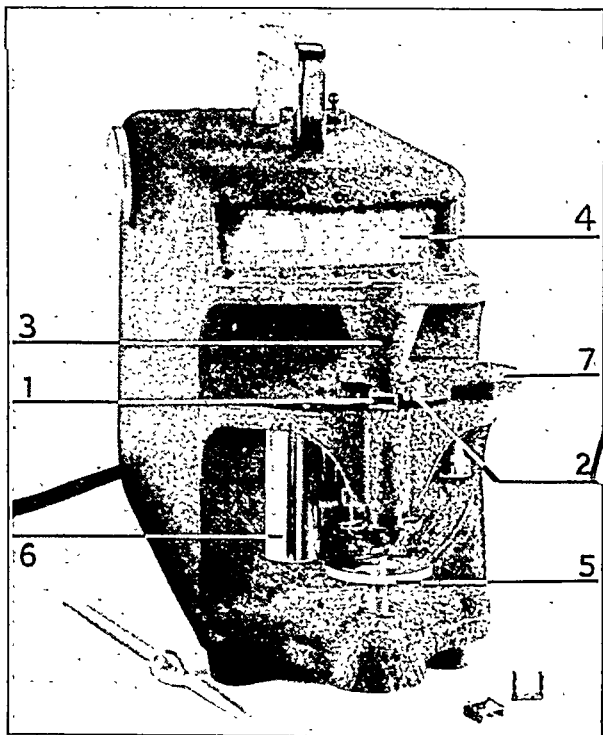
Clinical Notes, Suggestions and New Instruments

A PHOTOELECTRIC HEMOGLOBINOMETER

GEORGE F. DICK, M.D., AND DANIEL S. STEVENS, PH.D., CHICAGO

The uncertain results given by the visual types of hemoglobinometers have suggested the use of photoelectric apparatus for the determination. However, the photoelectric colorimeters have been too expensive for purchase by most physicians.

Our photoelectric hemoglobinometer is so designed that it can be manufactured for a price comparable to the cost of other hemoglobinometers and furthermore is simple and convenient to use. This is accomplished by using a small disposable celluloid cell for holding the diluted blood. This feature has



Dick-Stevens photoelectric hemoglobinometer, showing the disposable cells and the blood diluting pipet.

resulted in an apparatus that can be constructed with the economies of modern molded plastics.

The operation of the hemoglobinometer can be seen by reference to the illustration. The disposable cell (1) is positioned in the light beam by a slot in the cell guide (2). The cone (3) which encloses the photo cell and filter has a small hole in its tip. This allows light from a restricted area of the disposable cell to reach the photo cell. The photoelectric current is indicated by a galvanometer the spot of which is focused on the scale (4). This scale is in an easy position to read and can be calibrated directly in units of hemoglobin.

The details of making a reading are as follows: An empty cell is placed in the instrument and the electric plug connected to the alternating current line. Light from a small bulb beneath the stage passes to the photo cell and causes the galvanometer to deflect.

The instrument should be allowed to warm up while the blood dilution is prepared. This is done by drawing blood from a cutaneous puncture into the pipet and then diluting with 0.1 per

cent sodium carbonate solution. Two minutes should be given for the red cells to lake, although a longer time does not involve a time factor.

The next step is to set the galvanometer spot at full scale deflection. This is done by raising or lowering the light source with a slight turn of the wheel (5). The disposable cell is now filled with the diluted blood from the pipet. This diminishes the amount of light reaching the photo cell, and the galvanometer moves down the scale to a position which indicates the amount of hemoglobin in the blood sample. The used cell drops into the container (6) when the handle (7) is drawn forward.

The instrument is calibrated by using several blood samples the hemoglobin content of which has been determined by the van Slyke oxygen capacity method. The hemoglobin values given by the machine can be relied on to be within 3 per cent of the correct value if a reading is taken using a single cell. This is sufficient for most purposes. However, the certainty of the reading can be increased by taking the average of two or more readings. This is easy to do since each pipet contains sufficient fluid to fill several cells. The volume of a cell is about 0.2 cc.

The cells are made by securely fastening clear celluloid windows to a spacer molded from similar material. If the cells are in contact with water for a time they absorb sufficient to cause shrinkage on drying. To avoid any uncertainties it is recommended that the cells be discarded after their first filling.

Considerable attention has been given to making the instrument as generally useful as possible. The pipets draw 15 cu. mm. of blood and dilute with the ratio of 1:100. This ratio is the same as with N. B. S. certified Thoma pipets. If Thoma pipets are used the hemoglobin can be determined with 1 cu. mm. of blood. This is of special interest when working with small animals.

The instrument can be used for other determinations besides hemoglobin. The most favorable substances are those giving dense color reactions that absorb green light. These include the reagent of the van den Bergh test for jaundice, sulfanilamide and sulfapyridine. Sufficient blood for these tests can be obtained from a cutaneous puncture. Satisfactory results have already been reported for such microtechnics.¹

PARAFFINOMA SIMULATING SEQUELAE OF VENOUS STASIS: A MALINGERER'S DEVICE

WILLIAM W. HEYERDALE, M.D., AND JAMES W. MADER, M.D.
ROCHESTER, MINN.

Factitious lesions often give rise to a confusion of diagnosis in many fields of medicine, sequelae of venous stasis and of varicose veins being no exceptions. We are reporting such a case which, without the significant history elicited, would have represented a rather bizarre and confusing picture.

A man aged 51, a resident of Canada after the war of 1914-1918, registered at the Mayo Clinic June 24, 1939. The history, physical examination and laboratory tests were suggestive of nothing significant except lumbar backache and varicose veins of the left lower extremity, considerable swelling and what appeared to be severe brawny infiltration or a low grade of chronic cellulitis of the left ankle and lower third of the left leg. The patient was referred to us for an opinion regarding his varicose veins.

Our examination showed incompetence of the left great saphenous vein and moderate sized varicosities of the left thigh and leg. Interesting, however, was the extreme degree of brawny infiltration and increase in the size of the left ankle. On palpation, this region was almost stony hard. This seemed a rather unusual although not impossible sequela of the moderate

degree of varicosity present and, on questioning, further significant history was elicited.

At the beginning of the war of 1914-1918 the patient had lived in a political district that was unwillingly subject to imperial



Fig. 1.—Medial aspect of left leg; varicosities, brawny induration and swelling are obvious.

Russia. In order to avoid being drafted into the army, the patient had gone to a physician, who

had injected hot wax into the subcutaneous tissues of the left ankle. This had caused the ankle to become swollen and, although the pain had lasted but a short time, the swelling had continued to the present. The deception apparently worked so well that the patient was able, by this means, to escape the Russian draft. He also stated that this physician had injected wax in other parts of the body of many other persons for the same purpose. The accompanying illustrations serve to show the effects produced in this case.

Unfortunately, the patient did not remain at the clinic for treatment. It would have been interesting to see to what extent, if any, the veins contributed to the brawny infiltration.

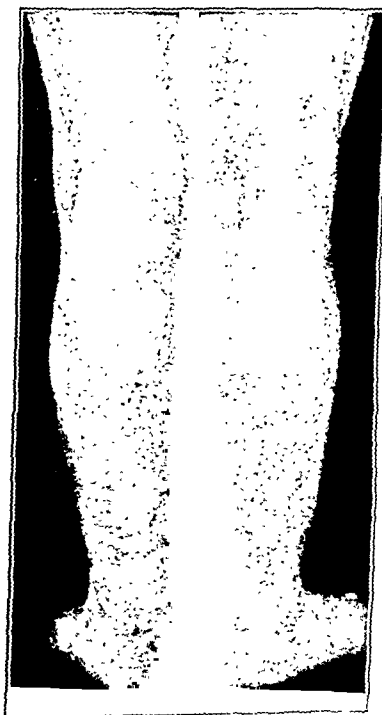


Fig. 2.—Posterior aspect; asymmetry due to brawny induration, the result of paraffinoma, is evident.

We have presented this case mainly to give another example of the many ways used by charlatans to produce artificial lesions in time of war and to show the results of such a lesion after a lapse of about twenty-five years.

1. MacLachlan, E. A.; Carey, B. W., Jr., and Butler, A. M.: Determination of Para-Aminobenzenesulfonamide; Micromethod. *J. Lab. & Clin. Med.* 23: 1273-1277 (Sept.) 1938. Marshall, E. K., Jr., and Cutting, W. C.: Absorption and Excretion of Sulfanilamide in Mouse and Rat. *Bull. Johns Hopkins Hosp.* 63: 328-336 (Nov.) 1938.
From the Section on Postoperative Care, the Mayo Clinic. Dr. Mader is fellow in surgery, the Mayo Foundation.

A CASE OF COLD URTICARIA WITH AN
UNUSUAL FAMILY HISTORYROY L. KILE, M.D., CINCINNATI
AND

HOWARD A. RUSK, M.D., ST. LOUIS

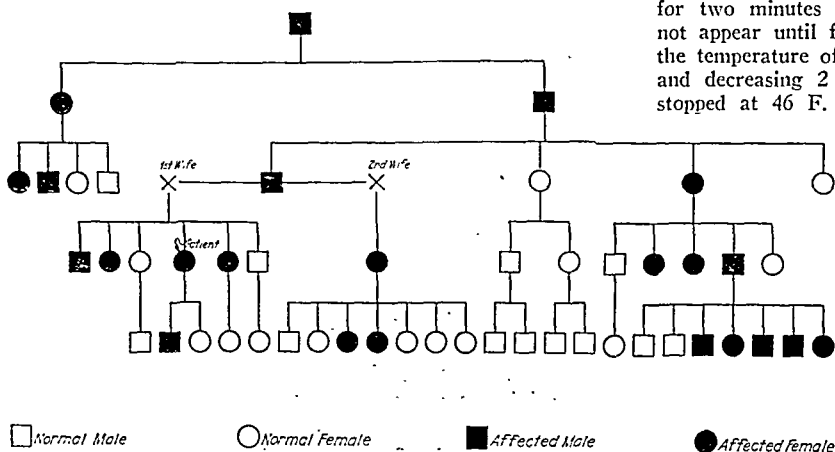
Many cases of urticaria produced by cold have been reported. The case to be reported is interesting not only because of the severity of the attacks but also in view of the extensive family history of urticaria caused by the same physical agent.

REPORT OF CASE

Mrs. R. M., aged 25, has had "all her life" an eruption which comes on when she is exposed to cold. In very cold weather when she goes outside even for a short time urticaria appears in about half an hour. This is accompanied by a chill and fever, the temperature ranging from 101 to 103 F., which lasts from four to six hours. Often there occurs a stiffness of the joints, with erythema of the adjacent tissues lasting from six to eight hours, and if the exposure is great enough it may last twenty-four or even forty-eight hours. At times headache accompanies an attack. In warmer weather she often notices urticaria in the morning on an arm or some other part of the body left out from under the covers during the night. No untoward effects have been noted from taking cold drinks. There is very little itching, but usually there is a "sticking" or burning sensation. The patient says that the eruption is worse in cool damp weather than it is when it is cool and dry.

The past history is irrelevant. She has had an eruption from quinine, phenolphthalein and acetylsalicylic acid which is entirely different. It fades in several days and is more of a diffuse erythema with marked pruritus. Her father has hay fever. There is no other familial history of allergy in other forms.

The family history is most interesting, however. Of forty-seven relatives who were remembered by the patient and her father, twenty-three have had the same allergy to cold. There seems to be little difference in the severity of attacks in all of them as far as the father and daughter know. Urticaria developed in the patient's son at 5 weeks of age, and he even had a chill after being exposed to cold at this early age. Her daughter does not have this condition. The patient's father, who is now 61, still has urticaria, and it is even more severe now than it was some years ago. Many physicians have seen various members of the family and tried different



The family tree; the age of the children increases in order from left to right.

methods of therapy, all with no improvement. While some of the offspring of involved parents have not had it, in no instance has it been transmitted by one who has not had the condition, as far as the family has been traced. This is particularly evident in the patient's normal aunt, who has a boy and a girl, each of whom has two children, and none are affected.

From the Department of Dermatology, Washington University School of Medicine, service of Dr. M. F. Engman, and the Laboratories of the Jewish Hospital, St. Louis.

Routine laboratory investigations of the patient were all within normal limits. The urine was normal even after an exposure to cold. The basal metabolic rate was —16 per cent. Numerous intradermal tests with inhalants and foods done in January 1938 at Washington University Clinics all gave negative results. Nasal smears showed many eosinophils, and a diagnosis of allergic rhinitis was made in January 1938. At about this time a diagnosis of early otosclerosis was

TABLE 1.—Results of Special Potassium Metabolism Studies

10-17-38:	Fasting blood serum potassium.....	26.1 mg. %
	(Normal by our method).....	19.5 mg. %
10-18-38:	Epinephrine tolerance test (0.5 cc. of 1:1,000 epinephrine intramuscularly)	
		Blood Potassium, Mg. per 100 Cc.
	Resting	
	10 minutes	98-58 24.1
	15 minutes	108-62 24.1
	30 minutes	108-56 22.8
	45 minutes	108-50 20.2
	1 hour	102-50 19.0
	2 hours	98-40 18.0
	3 hours	110-60 19.8
	4 hours	110-68 20.2
	5 hours	130-88 21.3
	6 hours	106-56 23.0
10-29-38:	Patient exposed to cold for one hour; chill developed with marked urticaria. Blood potassium determinations were made at hourly intervals during the duration of hives and were as follows:	
		Blood Potassium, Mg. per 100 Cc.
	1 hour	21.5
	2 hours	21.0
	3 hours	21.3
	4 hours	21.8
10-31-38:	Patient was put on porch and cooled to the point of chilling with typical urticarial attack following; 5 units crystalline insulin was given with the following result:	
		Blood Sugar, Mg. per 100 Cc. Blood Potassium, Mg. per 100 Cc.
	Before insulin	90 20.7
	2 hours after insulin	62 20.5
11-2-38:	Patient chilled during night but received crystalline insulin at 10 p. m. 11-1-38 and at 7 a. m. 11-2-38. At 8:30 a. m. 11-2-38 the blood sugar was 46 mg. per hundred cubic centimeters; blood potassium, 18.9 mg.	

made at the same clinic after a series of hearing tests. There is no family history of this condition.

A bath in which her arm was immersed in water at 50 F. for two minutes caused pain and erythema. Urticaria did not appear until four hours later. An attempt at decreasing the temperature of the water baths starting down from 60 F. and decreasing 2 degrees F. a day was unsuccessful. She stopped at 46 F. because of the pain.

The results of special potassium metabolism studies carried out at the Jewish Hospital are given in table 1.

The patient was then placed on a low sodium, high potassium diet and potassium chloride 20 grains (1.3 Gm.) three times a day with crystalline insulin twice a day for one week. At the end of this time there had been no subsidence of symptoms but the blood potassium was essentially normal.

Large doses of splenic extract and histaminase were tried without success, although the blood potassium was maintained at a level of 20.3 per hundred cubic centimeters, checked at weekly intervals. This was contrary to previous observations¹ in that ordinarily when an increased blood potassium is reduced to normal in urticaria the symptoms subside.

Tests on other members of the family suffering from cold urticaria, taken at varying times, gave results presented in table 2.

It is unusual to find twenty-three members of a family pedigree traced through forty-seven relatives, all of whom suffered

1. Rusk, H. A.; Weichselbaum, T. E., and Somogyi, Michael: Changes in Serum Potassium in Certain Allergic States, *J. A. M. A.* 113: 239 (June 10) 1939.

from the same form of allergy. Usually some other manifestation is present in many of the relatives. It is also interesting that thirteen of the twenty-three involved relatives were females. Cockayne² says that whatever manifestation of allergy is studied it is found that the number of males affected exceeds that of females. This is not true in this particular pedigree.

TABLE 2.—*Blood Potassium in Other Members of Family Suffering with Cold Urticaria*

	Blood Potassium, Mg. per 100 Cc.
Uncle	21.5
Cousin (diphtheria antitoxin 2 days previously)	22.4
Sister	19.5
Cousin	19

Potassium metabolic studies revealed the usual abnormalities reported previously by one of us,¹ except that in the acute attack there was not the usual rise in blood potassium. In spite of the lowering of the blood potassium to normal and its maintenance at this level for a long period there was no improvement in the clinical symptoms.

The severity of the attacks of allergy to cold, the extensive family history and the unusual refractiveness to all types of therapy have made this case a most interesting one.

1219 Carlew Tower—901 Beaumont Medical Building.

QUININE TREATMENT OF DYSTONIA MUSCULORUM

FREDERICK LEMERE, M.D., SEATTLE

In a recent article Hassin¹ reported treatment of three cases of dystonia musculorum with quinine with definite relief of the excessive involuntary, uncontrollable movements characteristic of this disorder. Because this disorder is rare and because of the marked benefit obtained with quinine, it was felt that the following case should be reported:

History.—A woman aged 23, single, who had to be assisted into the office because of twisting, writhing movements of the extremities, head and trunk, had a blister on the left foot at about the age of 11, followed by weakness of the left ankle and pain in the left knee and hip. Disability of the left leg gradually developed, with the onset of twisting contortions of the back and neck during the past three years. The torsion spasms of the trunk had become so bad that she could not walk without assistance and was confined to her home.

She had been seen by many doctors, including several at orthopedic clinics, all of whom had diagnosed hysteria except one, who diagnosed "St. Vitus dance." Several psychologists and social workers had worked out beautiful mechanisms for her illness, based on overprotection and thwarted ambitions to be a dancer and singer. She was referred as a psychiatric problem and had been told she could "snap out of it if she would only try." All this only made her worse, as emotional stress and strain aggravated her contortions.

Examination.—The patient was an attractive young woman with constant torsion spasms of the neck and trunk which would bend her almost to the floor and sweep her around in uncontrollable twisting movements. The neurologic examination was negative, except for these torsion spasms. Mentally she was depressed over her condition and the idea that had been pounded into her head that she was responsible for not controlling herself.

The diagnosis was dystonia musculorum.

Treatment consisted of quinine to the point of cinchonism.

Progress.—The patient's mother one month later wrote:

Have I written you since Arline has started taking the quinine? When she first started we gave her 15 grains a day, but after three days she was unable to take it as it made her so sick. She got such a chill she could hardly stay in bed. After three days we started giving her 9 grains a day and now she is back to 15 grains a day. She is feeling so well, has gained 15 pounds and can walk ten blocks easily. If her neck was straight she would be well. After having taken the quinine for less than two weeks the jerking in her body stopped entirely, and she sits on a chair just as well as any one.

2. Cockayne, E. A.: *Inherited Abnormalities of the Skin and Its Appendages*, ed. 1, London, Oxford University Press, 1933, p. 364.
1. Hassin, G. B.: *Quinine and Dystonia Musculorum Deformans*, J. A. M. A. 113:12 (July 1) 1913.

Is there anything we can do about her neck? It makes her very tired by night.

When we took her to you at first we could not let her touch a thing as she dropped it, and her body was black and blue all over from falling, and now she can do anything she cares to, she has perfect control of her hands, and I haven't seen her fall in two months. She has even done some dancing around the house.

A brace was advised for the neck but one month later the mother wrote:

I don't think a brace would really pay because right along she makes remarkable improvement.

CONCLUSION

Hassin's belief that dystonia musculorum is due to a disturbance of muscular tone and not to a central lesion in the basal ganglions is borne out by the beneficial effects of quinine, which acts on the myoneural junction.

706 Medical and Dental Building.

Special Articles

THE ÉMIGRÉ PHYSICIAN IN AMERICAN MEDICINE

DAVID L. EDSALL, M.D.

Honorary Chairman, National Committee for Resettlement of Foreign Physicians

TRYON, N. C.

During the past year, articles in the medical press have continued to give the impression that the United States is suffering from an influx of vast numbers of foreign physicians, whereas the official figures from the Department of Immigration show that between July 1934 and September 1939 some 2,544 physicians immigrated to this country. Emphasis has been laid repeatedly on the need to restrict the licensure of foreign physicians in order to protect both the medical profession and the public, since the medical and ethical standards of these physicians might fall below our own. This attitude is to a large extent a result of the economic problems which confront nearly every American physician. Changing methods of medical practice and financial insecurity are a part of the present day national situation, which is neither caused nor aggravated by the émigré physician, against whom a policy of exclusion has been specifically directed regardless of his personal qualifications.

More than 1,000 foreign physicians have already been established throughout the country; about 1,500 remain to be resettled. They are largely concentrated in the four Eastern seaboard states, where licenses can still be obtained and where additional physicians are least needed. Since there are many rural districts in need of medical services, the difficulty lies not so much in numbers as in distribution. Owing to the existing restrictions in forty-four states, it is impossible for émigrés to be resettled in those states where their services might be desirable, in some of which American physicians have been unwilling to avail themselves of opportunities for practice.

The National Committee for Resettlement of Foreign Physicians is convinced that this attitude toward the refugee physicians is based on a misapprehension of the facts. I propose to restate the entire problem so that it may be dealt with on a more realistic basis. This committee is fully aware of the need of a careful evaluation and selection of émigré physicians and has consequently occupied itself with a study of the qualifications of individual physicians to eliminate the unfit. It is now incumbent on the country to participate in the equitable distribution of qualified individuals.

THE NATIONAL COMMITTEE FOR RESETTLEMENT
OF FOREIGN PHYSICIANS

In my letter to *THE JOURNAL* in May 1939 I¹ stated the purposes of the National Committee for Resettlement of Foreign Physicians as threefold: (1) to evaluate the eligibility of individual émigré physicians to practice medicine in the United States, (2) to assist those who were found competent in preparing for examinations and for American medical requirements and (3) to further their resettlement in those parts of the United States where medical services are needed. Our committee has been actively engaged in this program in cooperation with the National Refugee Service, Inc. (formerly the National Coordinating Committee).² Prominent physicians throughout the country are now forming state committees. Table 1 lists the groups already organized and functioning. In addition, California, Georgia, Louisiana, Missouri, North Carolina, Ohio, Pennsylvania, Texas and Virginia have cooperating committees, and it is intended that in the near future these and others shall be represented on the National Committee.

THE FACTS ABOUT FOREIGN IMMIGRATION

It may be helpful to review the situation of general immigration to the United States since 1932 as a background for the examination of the case of refugee physicians.

It is not generally understood that between July 1, 1932, and July 1, 1938, the total emigration from the United States to Europe exceeded by 4,000 the total immigration to the United States. Thus the foreign population of the country was actually shrinking during that period.³

TABLE 1.—Groups Organized and Functioning on
Resettlement of Émigré Physicians

Connecticut	Illinois	Maryland
Dr. Harvey Cushing †	Dr. Joseph A. Capps	Dr. Lewellys Barker
Dr. Alice Hamilton	Dr. Julius Hess	Dr. John M. T. Finney
Dr. Samuel C. Harvey	Dr. Rollo K. Packard	Dr. William H. Howell
Dr. John F. Peters	Dr. William F. Peterson	Dr. Edwards A. Park
Dr. M. C. Winternitz	Dr. D. B. Phemister	
Massachusetts	New Jersey	New York
Dr. Stanley Cobb	Dr. Henry C. Barkhorn	Dr. Ernst P. Boas
Dr. David L. Edsall	Dr. Max Danzis	Dr. Alfred E. Cohn
Dr. Jacob Fine	Dr. Royal Schaaf	Dr. Lewis A. Conner
Dr. A. Baird Hastings	Dr. Edward W. Sprague	Dr. N. Chandler Foot
Dr. Joseph Pratt	Dr. Harrison Martland	Dr. J. Bentley Squier

† Deceased.

In the last seven years there have been no changes in the quota regulations. The total number of immigrants from all countries has been less than the potential peak under the quotas.⁴

The specific problem of refugee physicians involves only 2,544 medical immigrants and not a cumulative yearly influx. The potential number to arrive from Europe in the future is minimal. During the period from July 1, 1934, to Sept. 1, 1939, when these 2,544 foreign physicians immigrated, a total of 27,500 physicians were newly licensed in the United States. We are therefore dealing with a comparatively small and limited group.

1. Edsall, D. L.: A Program for the Refugee Physician, *J. A. M. A.* 112: 1986 (May 13) 1939.

2. Edsall¹ (for the structure and function and subcommittees of the National Coordinating Committee; for further information, apply to Charles H. Jordan, Secretary, Committee for Resettlement of Foreign Physicians, 165 West Forty-Sixth Street, New York).

3. Refugee Facts (American Friends Service Committee pamphlet), p. 12.

4. Social Work Today, December 1939, p. 14: "Who Is the New Immigrant?"

CENTRAL OFFICE OF THE COMMITTEE
(NATIONAL REFUGEE SERVICE,
INC., NEW YORK)

Since the organization of the National Committee for Resettlement of Foreign Physicians in February 1939 to Jan. 1, 1940, 1,646 foreign physicians have been registered at the central office in New York. Many of these men had been in the United States for several years. A complete file of individual credentials and qualifications is made available to the advisory boards of the twenty medical specialties, and each candidate is carefully interviewed and evaluated by qualified American physicians. Those adjudged unfit to practice are advised to retrain for other occupations. By means of lectures, courses and voluntary externships, those recommended for resettlement are acquainted with American methods in medicine while they are studying for licensing examinations.

The statistics of this office show that aside from the physicians who have been licensed and are practicing in the state of New York there are 106 licensed physicians awaiting resettlement and 990 awaiting licensure. Sixty have been placed in internships and hospital positions in New York State and seventy-eight in twenty-four other states. Twelve have obtained laboratory positions. These figures do not take into account externships and supernumerary internships.

Physicians have been settled in rural sections of Connecticut, Illinois, Maryland, Massachusetts, New Jersey, New York and Ohio. Gratifying reports indicate that they have been welcomed and have made a good adaptation to the local scene. Interns have also proved their capacity to meet American medical standards. Some men have been well received in chairs of medicine—often in departments that were previously understaffed—in the laboratory sciences, in the specialties, in hospital laboratories and in public health work. Only a trifling number of complaints have been made about their attitude, performance or assimilability.

DIFFICULTIES WITH THE RESETTLEMENT OF
FOREIGN PHYSICIANS

While the selection and retraining of foreign physicians has been proceeding according to this program, resettlement has been slow because of a general misunderstanding of the problem, as reflected in the restrictive regulations imposed by many state examining boards. *THE JOURNAL* recently published a table showing the statutory provisions and regulations of the states with respect to citizenship and first papers.⁵ Table 2 analyzes this problem and brings the statistics to date. This revision has been necessary because certain serious obstacles to the licensure of refugee physicians were omitted from the original. For example, it did not specify graduation from an American college and intern requirements as prerequisites to licensure. In addition, since its original publication there have been changes in state laws.

Required Citizenship.—Analysis of table 2 shows that citizenship is mandatory by statute in ten states and by regulation of state medical boards in eighteen. The question arises whether the resolution of the House of Delegates of the American Medical Association, June 13, 1938,⁶ recommending that citizenship be made a prerequisite to medical licensure is to the best interests of medical standards and whether such laws or regulations are constitutionally tenable.

5. Citizenship as a Condition Precedent to Medical Licensure in the United States, editorial, *J. A. M. A.* 113: 1496 (Oct. 14) 1939.

6. Proceedings of the San Francisco Session, Report of House of Delegates, *J. A. M. A.* 111: 41, 45 (July 2) 1938.

The citizenship requirement is both unfair and futile, for it is not a permanent barrier to licensure, and five years of waiting for citizenship is tantamount to five years of medical inactivity, deterioration of professional skill and acumen—five years of sapping of nervous stability. Many of the émigré physicians have lived

ernor Olson, of California, in vetoing a bill that would have required citizenship for a license to practice medicine in that state, issued a statement in which he said:

This bill would eliminate practice by some of the world's greatest medical scientists. It would also work a hardship on other qualifying physicians by compelling a wait of several years necessary to acquire citizenship before being permitted to earn a livelihood in their profession.

This bill would deny such privileges to aliens even if they have declared their intention to become American citizens. All other civil rights and privileges are granted those who have declared such intention in every state or federal statute where citizenship qualifications are imposed.

This bill is not directed toward an exclusion from medical practice on any basis of competency or qualification for such practice.

Lastly, the Federal Government has control of the admission of aliens and the states should not, and probably as a matter of constitutional law cannot, deny such aliens a right to earn a livelihood in any proper pursuit.

Admission to State Board Examinations Restricted to Graduates of Approved American and Canadian Schools.—Only four states have statutes proscribing the licensing of foreign medical school graduates, but twenty-six bar them on the basis of regulations set up by state boards of medical examiners. Six of the latter group of states require fourth year attendance in a class A medical school in the United States. These

regulations apply to American citizens who have studied abroad, as well as to refugee physicians.

The prevailing attitude of the American Medical Association on this issue is that "the Council on Medical Education and Hospitals does not grade or classify medical schools outside the United States or Canada. No opportunity is afforded for visiting and inspecting such schools, nor are official reports received from them. The Council therefore has no evidence on which to base a rating."⁹ There is no doubt that the intention of this policy, as adopted by the state boards, is to

through not one but several uprootings. They now come to the United States with declared intent to become citizens, willing and eager to take up residence in those regions where doctors are needed and to become a part of whatever community wants them. It is a contravention of both common sense and justice to create circumstances that compel them to live in large cities near relief centers, where they have the parlous choice of waiting five debilitating years or of entering professional competition precisely where the profession is most overcrowded.

The constitutionality of the citizenship requirement for medical practice is distinctly questionable and has never been passed on by any appellate court.⁷ As early as 1926 the attorney general of South Dakota declared it to be unconstitutional. More recently the attorney general of Texas delivered a similar opinion, holding a law of that state to be invalid, and the attorney general of Utah declared the constitutionality of the citizenship requirement to be questionable and ruled that the examining board cannot lawfully adopt a regulation imposing that requirement. THE JOURNAL recently reported a decision of a district court in Texas upholding the citizenship requirement.⁸ Unfortunately, this report is misleading. The actual decision of the court was in favor of the applicant on the ground that he had filed his application before the statute was amended to require citizenship. Furthermore, the applicant in this case was a resident of Mexico, and thus the issue of the constitutional rights of a lawful resident of the United States was not before the court. The court's opinion was not made a matter of record, and the attorney general remained of the opinion that the imposition of the citizenship requirement violates both the state and federal constitutions. Finally Gov-

7. McIntyre, J. E.: Citizenship and Medical Licensure, J. A. M. A. 112: 1075 (March 18) 1939.

8. District Court in Texas Rules State May Require Citizenship in Licensure of Physicians, editorial, J. A. M. A. 113: 1495 (Oct. 14) 1939.

IMMIGRANTS ADMISSIBLE UNDER QUOTA LAW



IMMIGRANTS ACTUALLY ADMITTED



EACH SYMBOL REPRESENTS 50,000 IMMIGRANTS

Courtesy, American Friends Service Committee

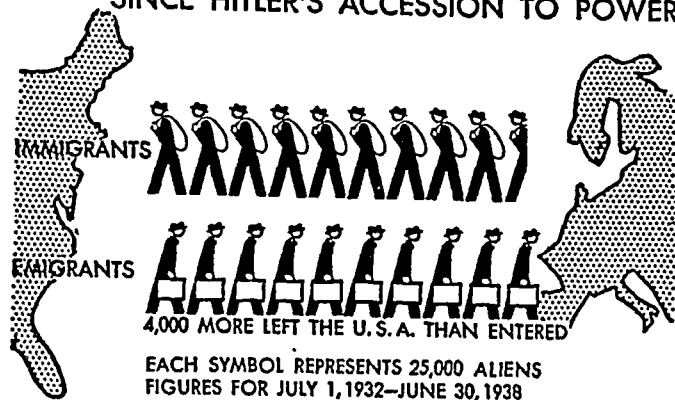
Fig. 2.—Seven years of immigration to the United States (since Hitler) July 1, 1932-June 30, 1939.

safeguard medical standards, but its execution results in the exclusion of qualified foreign graduates from practice on the basis that their credentials cannot be evaluated.

In evaluating foreign graduates, the National Board of Medical Examiners uses a list of foreign medical schools which is virtually the same as that issued by the Royal College of Physicians in the British Empire, and this list is available and published. Blanket exclusion of continental schools cannot logically be supported by any group which has accepted the National

9. Medical Education in the United States and Canada, J. A. M. A. 113: 772 (Aug. 26) 1939.

MIGRATION TO AND FROM THE UNITED STATES SINCE HITLER'S ACCESSION TO POWER



PICTORIAL STATISTICS, INC.

Courtesy, American Friends Service Committee

Fig. 1.—Migration to and from the United States since Hitler's accession to power.

(b) He is in most instances learning a language in which he must also be examined, a particularly difficult task for men

10. Medical Licensure Statistics for 1938, J. A. M. A. 112:1722 (April 29) 1939.

fourteen restrictive states, eighty-five passed and only thirty-three failed.¹¹

I do not know whether the failures were due to scholastic, language or personality difficulties, but the fact that more than two thirds of the entire group passed shows that there is no widespread scholastic incompetence.

Internship Requirement.—By law in three and by regulation of the state board in fifteen states, internship in a hospital approved by the American Medical Association is required of graduates of foreign medical schools. Further, the Council on Medical Education and Hospitals of the American Medical Association adopted the following resolution:⁹

That when suitable graduates of class A schools in the United States and Canada are not available, hospitals approved for intern training may accept graduates of European universities who have passed parts I and II of the examinations of the National Board of Medical Examiners.

No distinction has been made between recent graduates and those of long standing. Recent graduates of foreign medical schools should complete American internships, but men over 35 who find it difficult or impossible to secure intern placement should not be

TABLE 3.—Results of State Board Examinations

	Passed	Failed
California.....	16	2
Georgia.....	1	0
Idaho.....	1	5
Illinois.....	43	11
Indiana.....	2	0
Iowa.....	5	1
Maine.....	0	6
Missouri.....	2	0
Oregon.....	1	0
Pennsylvania.....	6	2
Texas.....	1	6
Virginia.....	2	0
Washington.....	2	0
West Virginia.....	3	0

penalized needlessly when they can give adequate proof of having taught or practiced successfully for years. Since the major issue is one of medical competence, selection might be permissible in favor of distinguished scholars and scientists who could make a definite contribution to medicine. About 65 per cent of the émigré physicians are between 40 and 55 years of age, and only about 22 per cent are less than 35. Moreover, about 900 available internships in approved hospitals remain unfilled from American medical schools.¹²

IS THERE A PLACE FOR THE ÉMIGRÉ PHYSICIAN IN AMERICAN MEDICINE?

There are at least 2,000 opportunities for practice of which American physicians have not availed themselves.¹³ That there is an urgent need for medical services in certain rural districts is evidenced by fifty-seven unsolicited requests for refugee physicians from thirty states in which such physicians cannot obtain licenses to practice.¹⁴

It has been the policy of the National Committee for Resettlement of Foreign Physicians to maintain the strictest selectivity in resettling the émigré physician. The local refugee committee makes a careful study of the community's medical needs, its willingness to accept the services of a foreigner and its capacity to

maintain a physician. The committee then recommends an émigré whose medical training and personal attributes conform to the specific community needs. When necessary, his training is supplemented in some special field. In some instances the committee extends loans for resettlement expenses or for necessary equipment which the community is unable to supply.

Under these circumstances, the current fears regarding the fitness of foreign physicians⁸ become groundless. The country should avail itself of the services of the Committee for Resettlement of Foreign Physicians of the National Refugee Service, Inc., which is prepared to act as a clearing house for information relating to foreign physicians who have registered there. Similar information may be obtained from the local branches in Boston, Chicago, San Francisco and elsewhere.

It has been the experience of this and other committees that émigré physicians are a distinct asset to the country when selected men are resettled in suitable places. I shall cite only four of the many cases of successful adjustment:

A General Practitioner Who Became a Research Parasitologist.—Dr. A., aged 45, who had been a physician in general practice in northern Germany, came to a Southern city in this country in 1936. The outlook for his starting a general practice was unfavorable; he therefore agreed to try a new field. Funds were collected for a fellowship in the department of tropical medicine of a Southern university and Dr. A. began to work. Since then he has shown remarkable adaptability in changing from general practice to experimental parasitology. His work is considered most satisfactory and the department is pleased with his progress, particularly with his researches on *Trichomonas*, oxyuriasis and the epidemiology of parasitic infestations in institutional groups.

The professor in charge of the department writes:

"It has been intensely interesting and gratifying to observe the progressive adaptation which Dr. A. has made. He came to us with practically no knowledge of English and essentially no specialized information in the field of medical parasitology and tropical medicine. His first year with us was devoted almost exclusively to learning the essentials in both of these necessary tools for work. Beginning with the second year he was of considerable help to us, and I have given him rather heavy responsibilities in the diagnostic laboratory. Within the past six months I have noted the marked advances, particularly in his ability to set down in relatively clear English the results of his studies. I am also finding him increasingly valuable as a consultant in investigational problems of the department."

An Obstetrician and Gynecologist in General Practice.—Dr. B. was born in Germany in 1900. After thorough training in obstetrics and gynecology he became clinical assistant first in a provincial midwife's institution and later in a hospital of the Jewish parish. Subsequently he established his own practice as a specialist in women's diseases and obstetrics.

After passing the New York state board examinations in 1938 Dr. B. and his wife, who is a trained masseuse, established themselves in an Eastern state. The community of 600 people in which they settled had been without a physician for three years and welcomed them heartily. A widower who had occupied a house on the main road turned it over to Dr. B. From the outset Dr. B. has been busy and able to support himself. He has been given the courtesy of the hospital in a nearby city but cannot operate until he becomes a member of the county medical society. He has been accepted by the community as one of its own and is gradually becoming a leader there.

A Clinician Who Received a Research Appointment to Continue His Previous Studies.—Dr. X, a well known German clinician in his late 40's, received an appointment as research associate in a large Midwestern academic institution. During the tenure of the stipend from the Emergency Committee in Aid of Displaced Foreign Medical Scientists he continued the clinical investigations in his special medical field which he had started abroad, and he was able to collect further important data. As a result of this endeavor he received an award from

11. These figures were compiled from THE JOURNAL throughout 1939.

12. Hospital Service, J. A. M. A. 112: 922 (March 11) 1939.

13. Medical Economics 16: 23-24 (March) 1939.

14. Alabama, Arizona, Arkansas, California, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin.

an American medical society and has published a textbook. After the expiration of the grant, Dr. X was invited to continue his studies at the university.

A Medical Scientist Appointed to a University to Do Research.—Dr. Y, a German physiologist in his 30's, had done very specialized work and was offered the opportunity to continue his experiments at one of our Eastern universities. After the expiration of a grant from the Emergency Committee in Aid of Displaced Foreign Medical Scientists, a smaller Western college procured Dr. Y's services in order to have him continue his particular research project there. This type of work had previously not been within the scope of the college's activities.

SUMMARY AND RECOMMENDATIONS

It is neither the desire nor the purpose of the National Committee for Resettlement of Foreign Physicians to flood any state with an unlimited number of unselected physicians. It is, however, the belief of this committee that the present attitude of some medical men toward the émigré has been based on a complete misapprehension and needless panic in regard to the actual number of refugee physicians in America. Less than 1,500 are awaiting the opportunity to practice at the present time, and this total is not likely to be much augmented. There are at least as many communities throughout the country requiring medical services which are unavailable to them because American physicians have found these locations undesirable and because refugee physicians cannot obtain licenses to practice there. A logical and constructive solution of the problem could be effected through the cooperation of the state licensing boards in the proper redistribution of qualified émigré physicians. Such a step would be wholly consistent with the traditional American policy of assimilating bona fide immigrants and would therefore serve the best interests of the public.

With the foregoing facts in mind, the National Committee for Resettlement of Foreign Physicians feels that immediate action throughout the country is necessary. Toward this end we make the following suggestions:

1. That states which do not require citizenship by statute and which have a reciprocal licensure clause with any other state grant reciprocity to foreign physicians already licensed by examination in that state.

2. That the fifteen states requiring citizenship by regulation of the state board change this requirement to first papers, adding a clause to the effect that the license of a physician who does not become a citizen at the expiration of the period required by the state department may be revoked.

3. That all state boards of medical examiners accept the list of accredited foreign medical schools utilized by the National Board and thereafter evaluate foreign physicians on their own merits and by examination rather than reject them by ukase.

4. That states which do not have statutory requirements but desire further evidence of competence in addition to a written examination shall grant temporary licenses specifying localities and conditions of practice—the licenses to be made permanent when the physicians attain full citizenship.

5. That where statutes have been passed requiring citizenship or graduation from an American university consideration be given to the desirability of repealing such statutes and substituting for them suitable regulations by state boards of medical examiners.

6. That the Committee for Resettlement of Foreign Physicians of the National Refugee Service, Inc., be utilized as a clearing house for information in regard to available émigré physicians for specific placements.

THE PHARMACOPEIA AND THE PHYSICIAN

THE THERAPY OF FUSOSPIROCHETOSIS (VINCENT'S DISEASE)

HENRY FIELD JR., M.D.

ANN ARBOR, MICH.

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopoeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Fusospirochetosis or Vincent's infection—infection by a symbiotic group of anaerobic organisms commonly present about the teeth—has not yet received adequate attention from a major proportion of the medical profession. Gingivitis and pyorrhea are so common that they are usually neglected and an unwarranted, hopeless attitude concerning them is prevalent. Grades of infection in the throat and lungs, less severe than the usual textbook pictures, are relatively frequent, and they are commonly not correctly diagnosed. This is due to lack of familiarity with their possible clinical manifestations and the difficulty in demonstrating the smaller varieties of spirochetes. The most invasive of the spirochetes, as indicated by their occurrence alone in some pleural effusions and their predominance in the sputum in some cases of severe lung infections, are so small that they can be seen in the dark field with the usual 1.9 mm. objective and funnel stop only with the most perfect lighting.¹ The illumination will be impaired by the presence of too many cells or debris. In such instances a diagnosis can be made without a suitable silver stain only by familiarity with the fusiform bacilli and recognition of their predominance among the visible organisms in a smear stained with an aniline stain.

Much remains to be proved about the treatment of fusospirochetel infection. Numerous drugs have been reported to give favorable results. Unfortunately, carefully controlled studies have not been made in which alternate cases in which different treatments are given have been compared. It seems that a large number of drugs give effective chemotherapy, that the possibility of harm is an important consideration in the selection of a drug and that more attention should be paid to the general treatment of the patient, particularly nutrition and, when the gums are involved, dental measures.

In the treatment of Vincent's infection it is of primary importance to consider and correct, if possible, conditions which permit organisms which are ordinarily apparently harmless saprophytes to become invasive.

Concerning variations in the virulence of different strains or in the same strain at different times there is suggestive evidence that occasional cross infections occur which are not otherwise explained. This seems to justify infectious precautions which would not otherwise be indicated.

Other local lesions such as tuberculosis, neoplasms, syphilis or diphtheria may facilitate a superimposed Vincent's infection. It may be that only after treatment of that infection will the underlying lesion be recog-

From the Department of Medicine, University of Michigan Medical School.

1. Personal observations. Vincent, R., and Seguin, P.: Les spirochètes de l'appareil respiratoire, *Bull. Acad. de méd.* 121: 407 (March 21) 1939.

nized. In the presence of a membranous exudate smears from which show a predominance of the fusospirochetal organisms, a culture for diphtheria bacilli should not be neglected.

Certain blood diseases such as acute leukemia, aleukemic leukemia, aplastic anemia, granulocytopenia and infectious mononucleosis are peculiarly apt to be complicated by Vincent's infection. Diabetic patients are also liable to such infection. Poisoning from heavy metals, benzene or its derivatives may be the antecedent to such infection. Acute infectious and chronic debilitating diseases predispose to Vincent's infection, probably in part because of an increased requirement for or a decreased intake of vitamins.

There is experimental and clinical evidence that a deficiency of any one of three vitamins may result in fusospirochetal infections. Vitamin C is incriminated by the finding of the mouth organisms invading the gingival tissues in scurvy,² by the correlation between gingivitis and capillary fragility,³ by the finding of low blood levels of ascorbic acid in patients with gingivitis⁴ and by the development not only of characteristic gingivitis but also of large foul ulcers following bites on the back, which do not otherwise occur, in guinea pigs deficient in vitamin C.⁵ Wollbach and his associates⁶ have shown that guinea pigs receiving inadequate amounts of vitamin C develop atrophy of the periodontal structures permitting loosening the teeth and pocket formation—favorable conditions for the growth of anaerobic organisms.

The evidence concerning the vitamin B complex is the occurrence of large numbers of the fusospirochetal organisms in pellagrous stomatitis⁷ and experimental blacktongue,⁸ and the marked improvement or cure in some cases of gingivitis or blacktongue following the administration of yeast concentrates.⁹

Recently Smith and his associates¹⁰ have shown that the Underhill and Mendel type of blacktongue (produced by a diet abundant in the vitamin B complex but deficient in vitamin A) is similar to the Goldberger and Wheeler type because both present fusospirochetal stomatitis. The former type could be prevented by supplements of cod liver oil but not by ascorbic acid and viosterol.

Until further evidence is available concerning the significance of lesser deficiencies of these vitamins in fusospirochetosis, it seems wise to give supplements of them amounting to at least a daily maintenance dose—more

if the previous diet has been inadequate¹¹ or if the patient does not take a fully adequate diet. Of the vitamin B complex, nicotinic acid seems to be the most important factor because of its effectiveness in cases of pellagrous stomatitis¹² and in those of experimental blacktongue.¹³ It may be desirable to give the whole complex derived from natural sources in doses equivalent to from 15 to 30 Gm. of yeast daily. Natural sources of the complex contain relatively small amounts of nicotinic acid.¹⁴ This may be started with from 40 to 60 mg. six to eight times a day. With such doses, in only occasional cases will cutaneous flushing and tingling occur before approaching saturation.

In the case of vitamin C, low blood levels are surprisingly frequent; there is evidence that occasionally deficiency may occur despite a normal intake and that oral doses may affect but little the level of ascorbic acid in the blood.¹⁵ Consequently it seems wise in critical situations to act on the assumption of a deficiency, if it cannot be disproved, and administer intravenously 2.5 Gm. of ascorbic acid in 0.5 Gm. doses during the first twenty-four to thirty-six hours. Because of the current discussion as to whether ascorbic acid is a complete antiscorbutic vitamin,¹⁶ and the lack of knowledge as to the relationship of the possible second antiscorbutic vitamin to fusospirochetosis, a large intake of vitamin C from natural sources is also advised. Parenteral chemotherapy, particularly with arsphenamine and allied compounds, requires consideration. Both good and bad results have been reported.¹⁷ My observations have been chiefly in cases of pulmonary infection. The disappearance of spirochetes from the sputum and the clinical course has not seemed different in those treated with nearsphenamine from those not so treated. Analysis of the favorable case reports¹⁸ shows that fever usually has not subsided promptly after the injection of arsenicals and that when sputum examinations following such treatment have been reported the organisms were still present. It seems apparent that arsphenamine is not a specific remedy for fusospirochetosis to the degree that it is for syphilis or that quinine is for malaria.

It is, however, difficult to overlook the observations of Smith¹⁹ that following the use of sulfarsphenamine

2. Hess, A. F.: Scurvy, Past and Present, Philadelphia, J. B. Lippincott Company, 1920, p. 100.

3. Nordenmark, Wolmar: Simultaneous Investigations into Gingivitis and Strength of Capillaries in Children: Results of Treatment of Subnormal Capillary Strength with Ascorbic Acid. Skandinav. Arch. f. Fysiol. 70: 186, 1934; Nord. med. tidskr. 8: 1490 (Nov. 3) 1934.

4. Weisberger, David; Young, A. P., and Morse, F. W., Jr.: Study of Ascorbic Acid Blood Levels in Dental Patients, J. Dent. Research 17: 101-105 (April) 1938.

5. Smith, D. T.: Oral Spirochetes and Related Organisms in Fusospirochetal Diseases, Baltimore, Williams & Wilkins Company, 1932, pp. 71, 187.

6. Boyle, P. E.; Bessey, O. A., and Wollbach, S. B.: Experimental Alveolar Bone Atrophy Produced by Ascorbic Acid Deficiency and Its Relation to Pyorrhea Alveolaris, Proc. Soc. Exper. Biol. & Med. 36: 733-735 (June 3) 1937.

7. Spies, T. D.: Treatment of Pellagra, J. A. M. A. 104: 1377-1380 (April 20) 1935. Blankenhorn, M. A., and Spies, T. D.: Oral Complications of Chronic Alcoholism: Significance, Recognition and Treatment, J. A. M. A. 107: 641-642 (Aug. 29) 1936.

8. Miller, D. K., and Rhoads, C. P.: Experimental Production in Dogs of Acute Stomatitis, Associated with Leukopenia and Maturation Defect of Myeloid Elements of Bone Marrow, J. Exper. Med. 61: 173-182 (Feb.) 1935. Smith, Persons and Harvey.

9. Gerstenberger, H. J.: Etiology and Treatment of Herpetic (Aphthous and Aphtho-Ulcerative) Stomatitis and Herpes Labialis, Am. J. Dis. Child. 26: 309-328 (Oct.) 1923. Sebrrell, W. H.; Onstott, R. H., and Hunt, D. J.: Treatment of Blacktongue with Preparation Containing and Evidence of Riboflavin Deficiency in Dogs, Pub. Health Rep. 52: 427-433 (April 9) 1937. Blankenhorn and Spies.

10. Smith, D. T.; Persons, E. L., and Harvey, H. I.: On Identity of Goldberger and Underhill Types of Canine Blacktongue: Secondary Fusospirochetal Infection in Each, J. Nutrition 14: 373-381 (Oct.) 1937.

11. The vitamin deficiencies were well summarized in a series of articles in THE JOURNAL last year. Tables of food values for vitamins can be found in the U. S. Department of Agriculture Bulletin, miscellaneous publications 275.

12. Spies, T. D.; Cooper, Clark, and Blankenhorn, M. A.: Use of Nicotinic Acid in Treatment of Pellagra, J. A. M. A. 110: 622-627 (Feb. 26) 1938.

13. Elvehjem, C. A.; Madden, R. J.; Strong, F. M., and Wooley, D. W.: Relation of Nicotinic Acid and Nicotinic Acid Amide to Canine Blacktongue, J. Am. Chem. Soc. 59: 1767, 1937.

14. D. Melnick in this laboratory has found about 0.5 mg. of nicotinic acid per gram of yeast and 1.2 mg. per gram of a good liver extract.

15. Haggmann, E. A.: Active Scurvy in Infant Receiving Orange Juice, J. Pediat. 11: 480 (Oct.) 1937. Kendall, A. I., and Chinn, H.: Decomposition of Ascorbic Acid by Certain Bacteria: Studies in Bacterial Metabolism, J. Infect. Dis. 62: 330-336 (May-June) 1938. Personal observations, to be published.

16. Rusznayk, S., and Szent-Györgyi, Albert: Vitamin P: Flavonols as Vitamins, Nature, London 138: 27 (July 4) 1936. Elmhay, A., and Warburg, E.: Inadequacy of Synthetic Ascorbic Acid as Antiscorbutic Agent, Lancet 2: 1363-1365 (Dec. 11) 1937. Birch, T. W.; Harris, L. J., and Ray, S. N.: Hexuronic (Ascorbic) Acid as the Antiscorbutic Factor and Its Chemical Determination, Nature, London 131: 273 (Feb. 15) 1933. Zilva, S. S.: Vitamin P, Biochem. J. 31: 915 (June) 1937 (Sept.) 1937; Nature, London 140: 588 (Oct. 2) 1937.

17. Smith, D. T.: Should Fusospirochetal Infections Be Treated with Arsenicals? Report of Cases, Arch. Otolaryng. 18: 769-769 (Dec.) 1933. Miller.

18. Symposium on Bronchiectasis and Lung Abscesses, 1931, p. 91. Black, W. C.: Acute Infective Stomatitis, Am. J. Dis. Child. 56: 126 (Feb.) 1931. Werner, Marie, and Luck, H. H.: The Fusiform Bacillus and Spirochete of the Vincent's Infection, J. A. M. A. 100: 707 (March 11) 1933. Kline and Berger.

19. Smith, D. T.: Relation of Vincent's Angina to Fusospirochetal Disease of the Lungs, J. A. M. A. 91: 23 (Jan. 4) 1930; footnote 2.

from one patient sputum and pus from experimental groin abscesses were no longer infective. Possibly part of the answer lies in the observation of Smith²⁰ that intravenous use of arsphenamine did not produce good results in chronic trench mouth until it was supplemented by dietary measures and thorough dental treatment.

As the matter now stands, it appears that the injection of arsenicals in instances of lesions not accessible to local treatment may be advised, provided it is not relied on to the neglect of other measures. With accessible lesions the hazard of toxicity is not warranted unless the lesion is exceptionally severe and invasive. It has been suggested that large doses of arsenicals may be harmful.²¹ For an adult weighing 150 pounds (68 Kg.), the following dosage of neoarsphenamine is suggested: 0.3 Gm. the first day, 0.45 Gm. the third and sixth days and a repetition of this dose at weekly intervals if necessary. Doses of approximately half these amounts have been suggested as safer. Acetarsone (stovarsol) given orally has been reported to give good results.²² If this is confirmed, it might replace the parenteral arsenicals.

Good results have been reported following the intravenous injection of antimony and potassium tartrate²³ and the intramuscular injection of fuadin,²⁴ an antimony compound developed for treatment of bilharziasis. The toxicity of these drugs is such that they would be recommended only in most unusual circumstances.²⁵ Death occurs in sudden collapse without the warning usually obtainable in arsphenamine poisoning.

Oral fusospirochetosis presents problems in prophylaxis and treatment for both physician and dentist. These are important not only intrinsically but also for the prevention of secondary infections elsewhere. Most of my patients with pulmonary fusospirochetosis have had more or less of a gingivitis.

The constitutional and nutritional factors involved in susceptibility to infection have been discussed. Local conditions favoring anaerobic infection are gingival crevices, flaps over partially erupted third molars, subgingival and supragingival calculus, overhanging crowns or fillings, malocclusion permitting impaction of food or loosening of teeth, caries and detritus. Smoking is said to lower local resistance.

There are various classifications of gingival and periodontal disease. For the purposes of this paper they may be simplified into pyorrhoea alveolaris and gingivitis. It is probable that they all have a similar primary etiology and represent different grades of activity of infection and secondary changes. The treatment is the same except as it is modified by differences in activity of infection and extent of pathologic changes. If there has been extensive resorption of the gums and alveolar processes, dental prophylactic treatment will probably be inadequate and periapical infection will

probably require extraction after any nutritional deficiency or hemorrhagic tendency has been corrected. The buccal mucosa and tongue may also be infected.

Peridontal treatment need not be discussed in detail. Its importance should be emphasized. No chemotherapy can be expected to give a permanent cure until local mechanical conditions such as those previously mentioned are corrected. Regarding the time for periodontal treatment, generally it is advisable first to attain an optimum saturation with the vitamins concerned and to relieve the acute manifestations of infection. The probability of an acute exacerbation following instrumentation will be thereby minimized.

Not all of the many drugs used for local chemotherapy can be discussed. They include numerous antiseptics, sodium perborate and hydrogen peroxide. The latter two are noxious to anaerobic organisms because of the nascent oxygen liberated from them.

Arsenical preparations are considered to have a specific action on the fusospirochetal organisms. Arsphenamine or a solution of it was used extensively for "trench mouth" during the World War. Ten per cent neoarsphenamine in glycerin has become a favored application. Smith²⁶ preferred solution of potassium arsenite (Fowler's solution) because it is cheaper and, he believed, more effective. At the dental clinic of this university a 1 per cent solution of acriflavine is commonly used in cases that are not too severe or resistant. It is introduced into the subgingival areas by means of a blunt pointed syringe.²⁷

Various bismuth salts have been used both for local application and for intramuscular injection. These require further study. Mangabeira-Albernaz²⁸ reported a 30 per cent emulsion of potassium and sodium bismuth tartrate²⁹ to be effective in sixty-four cases of phagedenic ulcer and four cases of oral fusospirochetosis.

Albray³⁰ summarized his objections to various other forms of local application on the grounds of inefficacy, staining of cracks in the dental enamel and of fillings or undesirable caustic effects.

Sodium perborate was also used extensively during the World War and later was popularized by Bloodgood.³¹ Objections have been raised against its use as a dentifrice or for uncontrolled treatment because of the chemical burns which it may produce. These are due largely to the sodium hydroxide originally in the powder or produced by disintegration reactions when it is dissolved.³² A neutral product can be obtained by the admixture of an acid phosphate.³³ A more serious objection, which apparently has not been considered, would seem to be the instability of sodium perborate with the consequent uncertainty of its efficacy as it is marketed. Manchey and Lee³³ report the loss of 70 per cent of the available oxygen in twenty-two days when a specimen was kept at a humidity of 88.5 per cent and a temperature of 100 F.

20. Smith, D. T.: Should Fusospirochetal Infections Be Treated with Arsenicals? Report of Cases, Arch. Otolaryng. 18: 760-769 (Dec.) 1933.

21. Spector, H. I.: Treatment of Bronchopulmonary Suppuration of Fusospirochetal Etiology with Small Doses of Neosalvarsan, J. Lab. & Clin. Med. 19: 66-67 (Oct.) 1933. Bettman, R. B.: Therapy of Nontuberculous Lung Abscess, J. A. M. A. 106: 1728-1731 (May 16) 1936.

22. Maxwell, C. H., Jr.: Treatment of Vincent's Angina with Acetarsone, New York State J. Med. 36: 874-878 (June 1) 1936.

23. Driscoll, T. J.: Treatment of Vincent's Angina, Virginia M. Monthly 51: 233 (June) 1924. Hillsman, J. A., and Driscoll, T. L.: Fusospirochetal Infection Which Developed During Active Arsphenamine Treatment, ibid. 52: 312-313 (Aug.) 1925.

24. Ross, T. W.: Vincent's Angina and Tartar Emetic, Northwest Med. 37: 49 (Feb.) 1938.

25. Khalil, M., and Betache, M. H.: Treatment of Bilharziasis with New Compound "Fuadin": Report of 2,041 Cases, Lancet 1: 234-235 (Feb. 1) 1930. Khalil Bey, M.: Excretion of Drugs; Its Influence on Therapeutic Results, with Special Reference to Antimony Treatment of Schistosomiasis, Lancet 2: 132 (July 18) 1936.

26. Smith: Oral Spirochetes and Related Organisms in Fusospirochetal Disease, p. 62.

27. Hard, D. G.: Vincent's Infection from a Public Health Standpoint, J. Michigan State Dent. Soc. 19: 60 (March) 1937.

28. Mangabeira-Albernaz: P.: Etiology and Etiological Treatment of Laryngoscope 38: 1-15 (Jan.) 1929.

29. "I" ion trepol used was shown by L. E. Warren of the chemical laboratory of the American Medical Association in 1925 to be not a complex potassium sodium tartrate but "virtually a basic bismuth tartrate containing small amounts of potassium and sodium salts as impurities (J. A. M. A. 84: 1067 [April 4] 1925).

30. Albray, R. A.: Vincent's Infection of Mouth, Laryngoscope 38: 250-263 (April) 1928.

31. Bloodgood, J. C.: Oral Lesions Due to Vincent's Angina: What Every Physician and Dentist Should Know About Its Recognition and Treatment, J. A. M. A. 88: 1142-1145 (April 9) 1927.

32. Gordon, S. M.: Sodium Perborate: Limitations of Its Use, J. Am. Dent. A. 22: 1761-1764 (Oct.) 1935.

33. Manchey, L. L., and Lee, S.: Chemical and Clinical Aspects of Sodium Perborate Therapy, J. Am. Pharm. A. 26: 890-896 (Oct.) 1937.

Hydrogen peroxide is a more dependable oxygen liberator and has been found very useful for supplementary home treatment. It has been used undiluted without apparent harm. I prefer to have it diluted with an equal volume of hot water to produce a temperature of 110 F. Its chemical activity is enhanced so by the heat that burns with vesiculation may be produced. If signs or symptoms of irritation appear a more dilute or cooler solution of hydrogen peroxide or a different solution may be used. Potassium permanganate 1:1,000 is in common use.

The following plan of local treatment is suggested: The patient should be seen one or more times a day while the infection is acute, that its progress may be observed and local applications made. The patient should use one of the mouth washes every two hours while awake, swishing it thoroughly between the teeth for two or three minutes. When the acuteness of the infection has subsided, the indicated periodontal and dental work may be started, mouth washes being continued and a local application being made after each instrumentation. This treatment should be carefully done and must be thorough to secure a permanent cure. As improvement occurs, the mouth washes may be gradually made less frequent but should be continued three times a day for weeks after apparent healing.

Local chemotherapy for fusospirochetal infections elsewhere may follow a similar plan, adapted to technical requirements.

Vincent's angina occurs much more frequently than it is diagnosed. As on the gums, milder infections than those manifested by ulceration or membrane may occur.³⁴ Contrary to some opinions, pronounced diffuse redness may occur. Any throat infection which begins unilaterally, which lasts more than four days, which has deep redness without a considerable leukocytosis (a moderate leukocytosis may occur in Vincent's infection although leukopenia is common) or which is associated with gingivitis is to be suspected.

Local applications are particularly important in Vincent's angina because of common difficulty with self treatment. The x-ray studies of Snow and Stern³⁵ and of Haase³⁶ with patients gargling a thin barium sulfate mixture did not show entrance of the barium into the pharynx. Gravity irrigation with the can 18 inches above the mouth was found to be effective. The patient's head should be tipped back and a little to one side, the pharynx should be held wide open while respiration is temporarily suspended and the overflow should be caught in a kidney basin held against the side of the face.

Vincent's infection of the nose, conjunctiva and middle ear is rare. In the latter it is apparently a secondary infection causing foul and occasionally bloody discharge in acute or chronic otitis media. For it Smith³⁷ advised both local and general treatment with arsenicals.

Although the fusospirochetal organisms are commonly found in the secretions beneath the prepuce and about the clitoris,³⁸ genital lesions are apparently rare among persons with good nutrition and good personal

hygiene. They were comparatively frequent in the World War³⁹ and numbered thirty-seven in a series of 622 cases of venereal disease at the Charity Hospital, New Orleans.⁴⁰ The same principles of treatment apply to these lesions as to other accessible lesions. The chief difference in opinion that has been expressed is with regard to a dorsal slit of the prepuce.⁴¹ This may frequently be necessary to make the lesions accessible.

The most commonly serious fusospirochetal infections are pulmonary. Lung abscesses and bronchiectasis have been most frequently associated with these organisms. Lung abscesses are usually the result of necrosis in a preexisting pneumonitis. I have called attention to the considerable number of cases of pneumonia without abscess formation the fusospirochetal etiology of which may be recognized.⁴² The importance of this recognition lies in the fact that a good immunity is not developed as readily as in other pneumonias. This gives a tendency to chronicity and to exacerbations. Convalescence should be managed with unusual conservatism. Exacerbation with abscess formation was observed in one case when bed rest had been continued for one month after the temperature remained normal and until the x-ray densities had cleared to what was considered to be a small residual fibrosis. In these milder infections the sputum may never be observed to be foul or it may be so for a few days only.

Aside from foul sputum, the manifestations which arouse suspicion of fusospirochetal etiology of pneumonia are a preceding chronic or recurrent pharyngitis, an associated gingivitis, postoperative occurrence, particularly more than forty-eight hours after operation and in a patient with gingivitis; acute development of symptoms after a prodromal period of cough and malaise without coryza; grossly bloody sputum later than expected in the course of pneumococcal pneumonia, or brown staining of portions of sputum with old blood and an unusually large volume of sputum. The latter is not essential. A few patients have had only a few mouthfuls of deeply blood-stained sputum for many days or for a few weeks.

Again the importance of prophylaxis is emphasized, particularly preoperative attention to oral hygiene and nutrition. Kline and Berger reported an incidence of 0.17 per cent postoperative pulmonary complications among ward patients during a four year period in which they were receiving preoperative oral therapy, compared with an incidence of 0.68 per cent among private patients who were not so treated.⁴³ Measures to prevent postoperative retention of secretions in the lung and consequent pulmonary complications have been discussed by Haight.⁴⁴

The principles of treatment of fusospirochetal pneumonitis are largely the same whether or not an abscess has developed. The majority of cases that are treated early will heal without operation. An optimal storage of the vitamins discussed should be attained promptly and maintained.

39. Reasoner, M. A.: *Ulcerative and Gangrenous Balanitis*, New York State J. Med. 27:767-773 (July 15) 1927.

40. von Haam, Emmerich: *Venereal Fusospirochetosis*, Am. J. Trop. Med. 18:595 (Sept.) 1938.

41. Brams, Julius, and Pilot, Isadore: *Study of Erosive and Gangrenous Balanitis, with Special Reference to Role of Fusiform Bacilli and Spirochetes*, Arch. Dermat. & Syph. 7:429 (April) 1923. Reasoner.

42. Field, Henry, Jr.: *Fusospirochetal Pneumonia*, J. Clin. Investigation 13:707 (July) 1934. Peirce, C. B., and Field, Henry, Jr.: *Fusospirochetal Pneumonia*, Am. J. Roentgenol. 33:451 (April) 1935.

43. Kline, B. S., and Berger, S. S.: *Pulmonary Abscess and Pulmonary Gangrene: Analysis of Ninety Cases Observed in Ten Years*, Arch. Int. Med. 56:733-772 (Oct.) 1935.

44. Haight, Cameron: *Intratracheal Suction in the Management of Postoperative Pulmonary Complications*, Ann. Surg. 107:219 (Feb.) 1938.

34. Personal observations, to be published.

35. Snow, William, and Stern, J. E.: *Gargling and Throat Irrigation*, J. A. M. A. 103:831 (Sept. 15) 1934.

36. Haase, W.: *Ueber das Gurgeln*, Klin. Wchnschr. 14:1244-1245 (Aug. 31) 1935.

37. Smith (footnote 5, p. 95).

38. Brams, Julius; Pilot, Isadore, and Davis, D. J.: *Studies of Fusiform Bacilli and Spirochetes: Their Occurrence in Normal Preputial Secretions and in Erosive and Gangrenous Balanitis*, J. Infect. Dis. 32:158 (Feb.) 1923. Pilot, Isadore, and Kanter, A. E.: *Studies in Fusiform Bacilli and Spirochetes: Occurrence in Normal Women About Clitoris and Significance in Certain Genital Infections*, J. Infect. Dis. 32:204-207 (March) 1923.

An early bronchoscopy should be done in search of a foreign body or neoplasm which may have been a precursor of the infection and to make sure that granulation tissue is not obstructing bronchial drainage. I am not convinced of the value of repeated bronchoscopies except when an unfavorable course causes a recurrence of the original indications.

On the basis of present information, the use of neoparsphenamine, as previously described, is advised as soon as other therapeutic requirements have been met.

Cough is commonly productive and if so should not be unnecessarily suppressed by narcotics. When tracheitis produces paroxysms of unproductive cough it should be treated with steam inhalations, a teaspoonful of compound tincture of benzoin or a few crystals of menthol being added to the kettle. If necessary, narcotics should be used conservatively. If reasonable relief from pleural pain is not obtained by strapping the chest, local heat and analgesics, narcotics should be given only in minimal doses. After initial relief, doses of from 6 to 8 mg. (one-tenth to one-eighth grain) of morphine sulfate, repeated as necessary, are preferable to periodic respiratory depression from larger doses given less frequently.

In cases of lung abscess, postural drainage should be tried from four to six times a day, or even more frequently when the results warrant, if the condition of the patient permits. Some experimenting may be required to determine the most favorable position. Sometimes, when the abscess is basilar, simply raising the foot of the bed with the patient lying in a selected position may be adequate and least fatiguing. An inverted and padded chair placed against the side of the bed will minimize the effort required of the patient by the head down position.

In any case, changes of posture every hour will facilitate expectoration and diminish the probability of the development of atelectasis. It appears that atelectasis is more apt to develop in fusospirochetal pneumonitis than in other pneumonias. It may be the result of obstruction of the smaller bronchi with exudate and secretion rather than obstruction of major bronchi.⁴⁵

Other therapeutic indications for general care are similar to those for any type of pneumonia. Bed rest should be continued for at least three weeks after the temperature has remained continuously normal and for one or two weeks after there has been complete resolution demonstrated by x-ray examination.

It is generally agreed that pneumothorax is not indicated in the treatment of lung abscess because of the danger of empyema. Also it seems irrational to promote atelectasis.

I believe that phrenic nerve interruption is usually contraindicated. It would seem that the benefit of relative rest and relaxation of intrapleural tension is overbalanced by inefficiency of cough, owing to failure of inspiratory descent of the diaphragm. Also there is the possibility of bronchial torsion interfering with drainage and favoring atelectasis.

The decision as to when surgical drainage is indicated for fusospirochetal lung abscess is difficult. It has been generally agreed that operation should not be done while an acute pneumonitis is still present, because of the risk at that time and because of the probability of cure with conservative treatment. When an abscess

becomes chronic, with a fibrous wall, it is not apt to heal without an operation, although it may possibly become asymptomatic. I have seen a fusospirochetal pneumonitis, without evidence of excavation, heal after a fluctuating course of nine months' duration.

It is a question of balancing the probability of a serious extension occurring during and that of a serious residue such as bronchiectasis occurring after conservative treatment against the probability of those events occurring after operation, in addition to the other hazards introduced by the operation. I am inclined to follow conservative treatment for at least two months. There will be varying factors in different cases which will influence the decision. An important consideration is whether adequate bronchial drainage of the abscess can be secured.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

IN CONSIDERING THE ACCEPTANCE OF A SUBMITTED OXYGEN-CARBON DIOXIDE MIXTURE, THE COUNCIL ASKED THE ASSISTANCE OF DR. ALVAN L. BARACH, ASSISTANT PROFESSOR OF CLINICAL MEDICINE AT COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK. DR. BARACH'S REPORT INVOLVED NOT ONLY THE SUBMITTED PREPARATION BUT ALSO A GENERAL CONSIDERATION OF THE USE OF OXYGEN-CARBON DIOXIDE MIXTURES. IN ACCEPTING THE SUBMITTED PREPARATION (DESCRIPTION OF WHICH WAS PUBLISHED IN THE JOURNAL, SEPT. 9, 1939, PAGE 1033) THE COUNCIL ADOPTED DR. BARACH'S REPORT AND VOTED THAT IT BE AUTHORIZED FOR PUBLICATION IN FULL AND THAT THE APPRECIATION OF THE COUNCIL BE EXPRESSED TO DR. BARACH FOR HIS REPORT.

PAUL NICHOLAS LEECH, Secretary.

OXYGEN-CARBON DIOXIDE MIXTURES

The recently accepted gas mixture Oxygen-Carbon Dioxide Mixture (the Denver Oxygen Company), claiming to be 90 per cent oxygen and 10 per cent carbon dioxide, fulfils this specification satisfactorily. The oxygen concentration tested 90.25 per cent plus or minus 0.2 per cent, the carbon dioxide concentration 9.75 per cent plus or minus 0.2 per cent.

The uses to which carbon dioxide-oxygen mixtures may be put are suggested in letters submitted by the company; these may be summarized by listing the following conditions: asphyxia from carbon monoxide poisoning, deoxygenation, morphine narcosis, alcoholic intoxication, the prevention and treatment of post-operative pulmonary atelectasis and resuscitation after respiratory failure from any cause.

PHYSIOLOGIC CONSIDERATIONS

The submitted gas mixture itself was found satisfactory. The use of carbon dioxide therapy has aroused considerable controversy for almost two decades both from the point of view of the underlying physiologic function and from the point of view of the results obtained from its employment. A comprehensive review of the extensive literature available is out of place in this presentation; however, the importance of the subject warrants a consideration of the physiologic basis on which carbon dioxide inhalations depend, since this is the first time that an oxygen-carbon dioxide mixture has been considered by the Council.

Although Paul Bert¹ originally showed that mountain sickness was due to the decreased partial pressure of oxygen in the thinner atmosphere, Mosso² took the position that the symptoms experienced were caused by a loss of carbon dioxide from the blood resulting directly from the diminished air pressure, a physiologic state of affairs which he called "acapnia." It was soon shown that the decreased carbon dioxide content of the blood was due to the increased breathing which oxygen want engendered. The significance of carbon dioxide in the regulation

45. Warner, W. P., and Graham, Duncan: Lobar Atelectasis as Cause of Triangular Roentgen Shadows in Bronchiectasis, Arch. Int. Med. 52: 888-904 (Dec.) 1933. Peirce and Field⁴² (case viii).

1. Bert, Paul: La pression barometrique, Paris, 1898.

2. Mosso, A.: Life of Man on the High Alps, translated from the Italian, London, 1898.

of respiration became clear with the work of Haldane and his associates,³ who showed that the volume of breathing of normal men was controlled in a precise way by the concentration of oxygen in the alveolar air. An increase in alveolar carbon dioxide was consistently accompanied by an augmentation of breathing proportional to the rise in carbon dioxide percentage in the alveolar air; oxygen want was said to stimulate breathing by heightening the sensitivity of the respiratory center to carbon dioxide.

The decrease in the blood content of carbon dioxide which occurs at high altitudes as a result of oxygen deficiency initiating increased breathing was thought by Yandell Henderson⁴ to indicate a pathophysiologic state (still termed "acapnia") which occurred in various types of clinical illness characterized by dyspnea. In numerous studies Henderson and Haggard⁵ developed the theory that loss of carbon dioxide from the blood was a serious and menacing condition which should be treated by inhaling carbon dioxide in increased concentrations, such as 5, 7 or 10 per cent, generally with the diluent gas oxygen. After it was discovered that a lowering of carbon dioxide in the blood was followed by an almost proportional decrease in the alkaline bicarbonates in the blood, importance was attached to the loss of bicarbonates, which was called "acarbica"; the term "acapnia" was retained to signify carbon dioxide deficiency.

The conditions in which undue loss of carbon dioxide was said to occur were those in which increased breathing takes place, such as oxygen want, the induction phase of anesthesia, and states of mental excitement. Henderson and Haggard⁶ considered that oxygen want was the first stage of asphyxia; this was followed by increased breathing which lowered the carbon dioxide content of the blood, the second stage, and finally by a compensatory decrease in the bicarbonates, which were said to migrate to the tissues, the third stage. It was shown that administration of a mixture containing from 5 to 10 per cent of carbon dioxide resulted in an increase in the bicarbonate content of the blood. Clinical benefit was also observed as a result of this procedure in animals exposed to narcotization and shock, such as stimulation of breathing and improved tonus of the body musculature.

However, grave doubts have been expressed as to the existence of carbon dioxide deficiency in most of the conditions in which it has been postulated. Concerning the recommendation of the inhalation of from 5 to 10 per cent carbon dioxide mixtures to patients who were thought to overventilate as a result of anesthesia, Peters and Van Slyke⁷ summarize their views as follows: "General anesthesia induced by ether and chloroform is attended by reduction of the bicarbonates of the blood and serum. Henderson and Haggard believed that the bicarbonate fall was a secondary effect of primary carbon dioxide deficiency brought about by overventilation during the excitement stage of anesthesia. It is now realized, however, that such a hypothesis is untenable. Van Slyke, Austin and Cullen, Kornblum and Robinson have shown that both bicarbonate and pH fall early in the development of the acidosis, an indication that bicarbonate is displaced from combination with base by other acids." Waters,⁸ reviewing more than twenty years' experience as an anesthetist, says: "Rarely in modern medical practice does one encounter a patient depleted of carbon dioxide because he has breathed too deeply. Under no condition of abnormal physiology does nature so quickly restore herself as in the elimination of carbon dioxide." Campbell⁹ has demonstrated experimentally in dogs that a rapid return of carbon dioxide to the blood takes place after severe hyperventilation has been

induced. Conversely, retention of carbon dioxide in the blood of from 50 to 100 per cent above the normal value takes place spontaneously in dyspneic patients treated by continuous inhalation of oxygen-enriched atmospheres, as shown by Barach and Richards,¹⁰ who studied the effect of oxygen on the increased pulmonary ventilation of congestive heart failure and pulmonary emphysema. The rise in carbon dioxide content takes place promptly as the pulmonary ventilation diminishes.

CLINICAL APPLICATION

Despite the lack of confirmation of the original concepts of carbon dioxide deficiency, the inhalation of carbon dioxide has other effects which are physiologically significant, such as increased pulmonary ventilation and increased muscle tonus (Henderson⁴). After operations the anesthetic gases are more swiftly eliminated by increasing the volume of breathing. Mucous plugs may be eliminated more easily by stretching the walls of the tracheobronchial tree. In respiratory depression the inhalation of mixtures containing increased percentages of carbon dioxide and oxygen stimulate the respiratory center and overcome anoxemia more quickly than oxygen alone.

The final word on the use of carbon dioxide after operations cannot be definitely stated at this time. Other procedures are being considered to remove the anesthetic gases. Since helium has a high rate of effusion and diffusion, Barach¹¹ proposed it as a vehicle for oxygen in conditions of respiratory obstruction; Jones and Burford¹² have employed helium-oxygen mixtures during anesthesia as a preventive of postoperative pulmonary atelectasis not only on the theory that it will penetrate areas of the lung inadequately ventilated and wash out anesthetic gas but especially with the concept that helium is a relatively insoluble gas and would therefore prevent collapse of alveoli after absorption of oxygen and the anesthetic gas.

The most secure indication for the inhalation of oxygen-carbon dioxide mixtures appears to be respiratory depression. In carbon monoxide poisoning, drowning, electric shock, morphine and alcohol intoxication, the respiration is depressed. Henderson and Haggard¹³ published their first paper on the inhalation of 10 per cent carbon dioxide and 90 per cent oxygen in 1920, and later a method designed for the inhalation of various carbon dioxide and oxygen mixtures, the most generally used being 5 and 7 per cent carbon dioxide, the remainder oxygen. Emergency rescue crews trained to give these mixtures for from fifteen to thirty minutes were organized, with the result that there has been a progressive drop in the mortality rate from carbon monoxide poisoning in New York City from the years 1926 to 1933. Henderson and Haggard showed that inhalation of carbon dioxide and oxygen produced a swifter elimination of carbon monoxide from the blood than inhalation of air or oxygen. Sayers and Yant¹⁴ adhere to the view that 100 per cent oxygen is as efficacious in preventing after-symptoms as the carbon dioxide and oxygen mixtures. The fact that carbon dioxide has a specific effect in releasing carbon monoxide from hemoglobin, shown in 1912 by Haldane¹⁵ and recently more clearly by Stadie and Martin,¹⁶ adds confirming and convincing evidence

3. Haldane, J. S.; Priestley, J. G., and Douglas, C. G., in Haldane, J. S., and Priestley, J. G.: *Respiration*, new ed., London, Oxford University Press, 1935.
4. Henderson, Yandell: *Adventures in Respiration*, Baltimore, Williams & Wilkins Company, 1938.
5. Henderson, Yandell, and Haggard, H. W.: *Respiratory Regulation of the CO₂ Capacity of the Blood, High Levels of CO₂ and Alkali*, J. Biol. Chem. **33**: 333 (Feb.) 1918; *Hematorespiratory Functions: The Reversible Alterations of the H₂CO₃:NaHCO₃ Equilibrium in Blood and Plasma Under Variations in CO₂ Tension and Their Mechanism*, J. Biol. Chem. **45**: 189 (Dec.) 1920.
6. Henderson, Yandell, and Haggard, H. W.: *Quantitative Clinical Chemistry*, Baltimore, Williams & Wilkins Company, 1931.
7. Peters, J. P., and Van Slyke, D. D.: *Toxic Effects of Carbon Dioxide*, New Orleans M. & S. J. **90**: 219 (Oct.) 1937.
8. Campbell, J. A.: *Tissue Oxygen-Tension with Especial Reference to Tetany and Convulsions*, J. Physiol. **60**: 347 (Oct. 25) 1925.
9. Barach, A. L., and Richards, D. W., Jr.: *Effects of Treatment with Oxygen in Cardiac Failure*, Arch. Int. Med. **48**: 325 (Aug.) 1931.
10. Richards, D. W., Jr., and Barach, A. L.: *Prolonged Residence in High Oxygen Atmospheres: Effects on Normal Individuals and Patients with Chronic Cardiac and Pulmonary Insufficiency*, Quart. J. Med. **3**: 43 (July) 1934.
11. Barach, A. L.: *The Therapeutic Use of Helium*, J. A. M. A. **107**: 1273 (Oct. 17) 1936.
12. Jones, O. R., and Burford, G. E.: *Massive Atelectasis Following Cyclopropane Anesthesia: Report of Cases and Theory of Cause and Prevention*, J. A. M. A. **110**: 1092 (April 2) 1938.
13. Henderson, Yandell, and Haggard, H. W.: *The Elimination of Carbon Monoxide from the Blood After a Dangerous Degree of Asphyxiation, and a Therapy for Accelerating the Elimination*, J. Pharmacol. & Exper. Therap. **16**: 11 (Aug.) 1920; *Report I of Commission on Respiration: The Treatment of Carbon Monoxide Asphyxia by American Gas Association*, J. A. M. A. **79**: 1137 (Sept. 30) 1922.
14. Sayers, R. R., and Yant, W. P.: *The Elimination of Carbon Monoxide from the Blood by Treatment with Air, with Oxygen and with a Mixture of Carbon Dioxide and Oxygen*, Pub. Health Rep. **38**: 23 (Sept. 7) 1923.
15. Haldane, J. B. S.: *The Dissociation of Oxyhemoglobin in Human Blood During Partial CO Poisoning*, Proc. Physiol. Soc. London **45**: 237, 1912.
16. Stadie, W. C., and Martin, K. A.: *The Elimination of Carbon Monoxide from the Blood: A Theoretical and Experimental Study*, J. Clin. Investigation **2**: 77 (Oct.) 1925.

of the value of adding carbon dioxide mixtures to oxygen in the treatment of carbon monoxide poisoning.

In respiratory failure in newborn infants, the inhalation of oxygen-carbon dioxide mixtures has been advocated by Henderson,¹⁷ Coryllos and Birnbaum¹⁸ and others. Expansion of an atelectatic lung may be hastened and mucus in the tracheobronchial tree may be loosened and subsequently eliminated by the deep breathing produced by carbon dioxide inhalations. Opponents of this procedure, such as Eastman,¹⁹ report an increased hydrogen ion concentration, a relatively high carbon dioxide content and a lowered bicarbonate content in the blood of infants born in asphyxia and conclude that "the use of carbon dioxide as a resuscitating agent in asphyxia neonatorum is not only superfluous but may be even harmful in that it tends to aggravate an already existing acidosis," a view maintained by Kane and Kreiselman.²⁰ Martinez,²¹ who also prefers pure oxygen to oxygen and carbon dioxide, employed a pulmotor (called a Resuscitator) in a series of 500 infants and believed it to be the most effective method of resuscitating babies. Despite early condemnation of the pulmotor, the employment of mechanical positive and negative pressure in a modern apparatus which has safety valves that prevent undue pressures in inspiration and expiration should be carefully reconsidered as a possibly beneficial resuscitating agent. Admitting the value of inhaling 5, 7 or 10 per cent carbon dioxide in combating respiratory depression, it should be remembered that other methods of providing oxygen to the tissues may be utilized. The Drinker Respirator is an example of a mechanical method of ventilating the lungs, and others are being developed which utilize alternating pressures. The value of carbon dioxide therapy cannot in the light of modern investigation be traced to a state of carbon dioxide deficit, since there has not been adequate evidence that such a state exists of sufficient severity or frequency in clinical illness. The advantages of a heightened pulmonary ventilation, increased muscle tonus, respiratory stimulation and a swifter disappearance of an anoxic state appear to account in the main for the marked benefit which this gas possesses, for the most part administered in combination with oxygen.

Mention has not been made of the administration of oxygen-carbon dioxide mixtures in the routine treatment of pneumonia or heart disease, as these claims were not advanced in the literature presented, and also because adequate physiologic or clinical evidence has not yet been published.

CONTRAINDICATIONS TO OXYGEN-CARBON DIOXIDE THERAPY

The inhalation of carbon dioxide in concentrations above 1 per cent stimulates the respiratory center and causes deeper breathing (Haldane³). The normal individual is conscious of an increased effort to breathe at concentrations of from 3.5 to 4 per cent, which is marked on even moderate exertion. To a patient who is dyspneic from congestive heart failure even these relatively low concentrations of carbon dioxide soon become unbearably burdensome. Concentrations of 5, 7 and 10 per cent administered for from five to ten minutes would provoke intolerable shortness of breath among the vast majority of dyspneic patients, especially in congestive heart failure, pulmonary emphysema and fibrosis. In massive collapse of the lungs, which may occur in the presence of postoperative pneumonia, the inhalation of carbon dioxide should be persisted in only until the breathing has been markedly increased in depth, for example, for a period of approximately five minutes.

When concentrations of 5 per cent are administered for periods over one-half hour, the signs of intoxication should be looked for. If 10 per cent carbon dioxide is given, the patient should

be under careful observation from the start, and after from ten to fifteen minutes carbon dioxide toxicity must be kept in mind. In most cases the indication for treatment is a maintained increase in pulmonary ventilation; if this is secured by relatively low concentrations, higher concentrations should not be employed. The continuous use of 10 per cent carbon dioxide should be the highest concentration for routine use. In general, when respiratory depression has been counteracted it is better to stop carbon dioxide therapy or decrease the concentration to the lowest percentage compatible with the object in view, either normal or hyperventilation. The symptoms which should suggest termination of carbon dioxide treatment are unbearable dyspnea, vomiting, disorientation or a systolic blood pressure of 200. When the blood pressure reaches 200 as a result of inhalation of 10 per cent carbon dioxide, cardiac collapse and a convulsion may occur. These convulsions have been regularly induced by still higher concentrations of carbon dioxide as a treatment in patients with dementia praecox,²² but they should obviously be avoided when carbon dioxide is administered as a respiratory stimulant.

Boothby²³ has warned against allowing a carbon dioxide concentration in excess of 1 per cent in any case in which there is the slightest degree of tracheal obstruction, such as may occur in operations on the upper part of the respiratory tract, after thyroidectomy and in the presence of considerable mucus in the respiratory tubal passageway. A heightened negative pressure within the chest becomes necessary to pull air into the lungs when there is obstruction between the alveoli and the larynx. If carbon dioxide were administered under these circumstances, the increased pulmonary ventilation would be accomplished by a still greater increase in the pathologically elevated negative-chest pressure, the results of which are pulmonary edema, due to direct suction pressure on the alveoli, congestion of blood in the lungs and delayed entrance of blood into the extrathoracic aorta during the inspiratory cycle (Barach, Martin and Eckman²⁴). Thus, in any clinical illness in which pulmonary edema is suspected, concentrations of from 5 to 10 per cent carbon dioxide are definitely contraindicated.

ADMINISTRATION OF CARBON DIOXIDE

The simplest method of giving a mixture of carbon dioxide and oxygen is to use a cylinder containing 5, 7 or 10 per cent carbon dioxide and 95, 93 or 90 per cent oxygen. In resuscitation cases, as from carbon monoxide poisoning, the 7 per cent carbon dioxide and 93 per cent oxygen mixture may be breathed through a mask during inspiration and exhaled through an expiratory valve during expiration. The mixture is delivered from the cylinder into a bag, which should be kept moderately full, and from there to the mask through a wide tube. The rate of flow is regulated by the gage. In one form of apparatus the movement of the bag on expiration acts as a lever shutting off the supply from the cylinder; on inspiration the supply recommences and is just sufficient for the needs of a patient.

A simple device has been used by Poulton in which a cylinder of pure oxygen fitted with a reducing valve delivers oxygen to a gas bag. Inspiratory and expiratory valves are fitted at the exit of the bag and a length of tubing of 1, 2 or 3 feet is interposed between the valve and the mask, which contains a single orifice to connect with the tube. The patient thus breathes pure oxygen, but in addition he rebreathes a certain amount of his own carbon dioxide from the dead space of the tubing.

Mixtures of oxygen and carbon dioxide may be used with a nasal catheter, but higher concentrations of carbon dioxide or larger flows of carbon dioxide and oxygen mixtures have to be employed because of dilution of the mixture during the inhalation of air. Carbon dioxide may also be administered in an oxygen tent; in this instance also higher concentrations of carbon dioxide than from 5 to 10 per cent or larger flows of the mixture are necessary to obtain the carbon dioxide concentration desired.

17. Henderson, Yandell: Incomplete Dilatation of the Lungs as a Factor in Neonatal Mortality, *J. A. M. A.* **96**: 495 (Feb. 14) 1931; Resuscitation, *ibid.* **103**: 750 (Sept. 8), **834** (Sept. 15) 1934.

18. Coryllos, P. N., and Birnbaum, G. L.: Bronchial Obstruction: Its Relation to Atelectasis, Bronchopneumonia and Lobar Pneumonia, *Am. J. Roentgenol.* **22**: 401 (Nov.) 1929.

19. Eastman, N. J.: Asphyxia Neonatorum, *Internat. Clin.* **2**: 274 (June) 1936; Fetal Blood Studies: Chemical Nature of Asphyxia Neonatorum and Its Bearing on Certain Practical Problems, *Bull. Johns Hopkins Hosp.* **50**: 39 (Jan.) 1932.

20. Kane, H. F., and Kreiselman, Joseph: The Carbon Dioxide Content of the Blood in the Newborn: Preliminary Report, *Am. J. Obst. & Gynec.* **20**: 826 (Dec.) 1930.

21. Martinez, D. B.: The Mechanical Resuscitation of the Newborn: Report of 500 Cases, *J. A. M. A.* **109**: 489 (Aug. 14) 1937.

22. Hinsie, L. E.; Barach, A. L.; Harris, M. M.; Brand, E., and McFarland, R. A.: The Treatment of Dementia Praecox by Continuous Oxygen Administration in Chambers and Oxygen and Carbon Dioxide Inhalations, *Psychiatric Quart.* **8**: 34 (Jan.) 1934.

23. Boothby, W. M.: Oxygen Therapy, *J. A. M. A.* **99**: 2026 (Dec. 10), 2106 (Dec. 17) 1932.

24. Barach, A. L.; Martin, J., and Eckman, M.: Positive Pressure Respiration and Its Application to the Treatment of Acute Pulmonary Edema, *Ann. Int. Med.* **12**: 754 (Dec.) 1938.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 23, 1940

HEARINGS ON THE NEW WAGNER BILL

On Monday, March 18, the Subcommittee of the Committee on Education and Labor held hearings in Washington on bill S. 3230 introduced by Senator Wagner for himself and Senator George. This is the Wagner bill to make available hospital facilities for needy areas. The legislation was requested by President Roosevelt in a special message sent to Congress on his birthday. A full report on the significant statements made at this hearing will be published in a forthcoming issue of *THE JOURNAL*. At the morning session Senator Wagner opened the hearing with a statement of the reasons for the introduction of this bill. He also stated definitely that he did not anticipate a report on the original Wagner bill at the present session of Congress but that he had not abandoned the bill and would expect a report at the next session. Dr. Thomas Parran, Surgeon General of the United States Public Health Service, explained the objectives of the bill and the significance of the various passages. For the American Medical Association there appeared Dr. Olin West, Secretary and General Manager, who called the attention of the committee to the platform of the American Medical Association and to the memorandum which had been left with the President of the United States by a special committee appointed by the House of Delegates. These have previously been published in *THE JOURNAL*. Dr. R. G. Leland discussed the costs of building hospitals and costs of maintenance and indicated the necessity for a careful study of the costs of construction and maintenance in relationship to the building of such hospitals as are contemplated under this measure. Dr. Morris Fishbein, editor of *THE JOURNAL*, presented an analysis of the bill, indicating that section 2 of the bill does not define any time limitation whatever on the operation of the measure or indicate the possibility of incorporation of this measure in any future act. He indicated also the desirability that the National Advisory Hospital Council to be established under this measure should be given real authority, with

the Surgeon General as chairman, as this measure may well be taken as a pattern for future legislation in relationship to the care of the sick. Under section 5 of the act it seemed desirable that the proposed advisory council be authorized to carry out provisions of the act, to formulate the standards, rules and regulations, review reports and inspections, and otherwise manifest actual authority rather than to act merely as an advisory body. Under section 6 of the act, the wording should be such as to limit the operation of the act exclusively to the conduct of the hospitals provided under the act, so that the act might not be used as authority for the Surgeon General of the United States Public Health Service to engage in general hospital surveys, inspection of professional services or the standards of hospitals. Special attention was called to part H of section 6, since the act makes no provision for disposal of the proposed hospitals should the leases be terminated by the Surgeon General. The suggestion was made that perhaps the Surgeon General should be authorized to negotiate with some other special agency for taking over the hospital, or that arrangements be made for the individual states to underwrite maintenance of such institutions, should local communities find it impossible to carry out their functions. It also seemed desirable that this section of the act forbid specifically that the federal government endeavor to man or maintain these hospitals. Attention was also called to a portion of section 7 of the act, which indicates that the Federal Works Agency be entitled to expend out of its appropriations such sums as may be necessary for the completion of these projects and without regard to specific limitations imposed on the use of the funds of the Federal Works Agency. Obviously this is a serious clause, because it removes limitations now existing on the Federal Works Agency as to the amount of money that may be spent on individual projects, and furthermore because it would permit expansion of the total sum available far beyond the actual appropriation. Thus the Federal Works Agency could provide all the costs of labor in the building of new hospitals to be constructed under this act. The recommendation was also made that the term "hospital" as used in the act shall be limited to physical facilities necessary for the care of the sick rather than, as now stated, "for the prevention, diagnosis, or treatment of disease, and for the protection of the public health." This seems important, since there is a wide divergence of opinion as to whether or not such hospitals shall be used as headquarters for public health agencies of the county, state or other organization to which a lease is granted or whether or not the hospital be devoted wholly to the care of the sick. Dr. W. D. Cutter of the Council on Medical Education and Hospitals supplied complete data regarding distribution of and need for hospitals.

Present at the hearing were Senators Taft of Ohio, Ellender of Louisiana, LaFollette of Wisconsin, George of Georgia, Wagner of New York and the chairman, Senator Murray of Montana, and for a brief time also

Senator Thomas of Utah. Senator Taft was particularly insistent in pointing out that the present measure abandons entirely the technic of grants in aid with matching appropriations. He was definitely opposed to the setting up of a chain of federal hospitals, feeling that the right to control such hospitals must rest with the individual states. Under no circumstances, he insisted, should federal institutions be permitted to interfere with nonprofit, voluntary or other private institutions. He also called attention to that section of the act which creates a new principle in relationship to the use of Federal Works Agency's money and WPA workers in construction of such institutions, insisting that preference might well be given unemployed labor and recognized workers concerned with the construction industry rather than to WPA workers exclusively.

At the afternoon session appeared Dr. John Peters, Mr. Ferguson representing the Federal Works Agency, Dr. Bert Caldwell for the American Hospital Association, Rev. P. R. Zwilling for the Protestant Hospital Association, and Monsignor William F. Montazon for the Catholic Hospital Association. Abstracts of their statements will be published as they become available.

Presumably the subcommittee will now prepare a new draft of the bill, incorporating such suggestions as were made which it thinks desirable.

Just as soon as such a new draft becomes available, it will be given consideration by the Board of Trustees of the American Medical Association, and the membership of the Association will be informed as to the point of view of the Board with regard to the measure.

THE PRESS COMMENTS ON THE APPEALS COURT DECISION

Although the time is brief since the United States Circuit Court of Appeals in Washington announced its decision that the practice of medicine is a trade, several of the leading newspapers in the country have already indicated their point of view regarding this decision. This point of view is not wholly in agreement with the United States Circuit Court of Appeals. A few papers, on the other hand, have expressed their enjoyment in the decision, notably the Washington, D. C., *Times*, the New York *Times* and the Indianapolis *Times*. As might be expected, the New York *Times* engages in another

slur at the American Medical Association and suggests that encouragement by the Association of various experiments "might have prevented the consideration of such monstrosities as the original Wagner Health Bill and would certainly have prevented a criminal action under the Sherman Act." This philosophizing of the New York *Times* after the event is a further indication of the complete failure of the editor of that newspaper even to begin to understand what the trouble is all about. Apparently both its editorial writer and Mr. Kaempffert (if they are not one and the same) have developed fixed opinions in this field and are not to be swayed by any attempt to examine carefully into the whole situation and the evidence.

The Washington, D. C., *Star* points out that the question of law in this case, despite its importance, is

overshadowed by the factual issues. The Indianapolis *Star* says that Americans who still oppose the attempted regimentation of the New Deal will derive little comfort from this decision and, it continues, "The feeling persists that the Department of Justice crusade against the national medical organization may have been prompted less by alleged restraint of 'trade' than for the purpose of destroying the desired independence of the medical profession." Moreover, the St. Louis *Globe-Democrat* emphasizes that "Doctors are con-

vinced, and correctly, that best interests of the nation's health can never be served by a system that would destroy the intimate relationship between physician and patient, that would put doctors on a salary, that would tend to stifle scientific initiative and the highest type of medical care." Commenting particularly on this decision, the St. Louis newspaper says "Legal interpretation often amazes the layman. For the court to designate the practice of medicine a trade seems preposterous. There is and always has been a chasm of distinction between trade and profession. Legal definitions, of course, have before been known to ignore the dictionary. Yet most learned judges have striven to interpret words accurately. Certainly the Congressmen who passed the Sherman Act never faintly imagined their law would be construed to apply to medical practice. This case should be promptly appealed to the Supreme Court. The American Medical Association is fighting for integrity of a profession that has given the United States the finest health protection of any

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

nation in the world. If it is to continue to new achievement it must be free of regimentation, unhampered in development of standards and morale and practice, whose requirements doctors themselves may be justly assumed to know best."

The Cincinnati *Times-Star* writes "This is a very far-reaching decision. Should it hold good in preventing medical societies from disciplining their members, it will prevent bar associations from imposing standards of legal conduct under penalty of disbarment. Its effect upon trade unions would be nothing less than to rule out the closed shop. It is true that the Clayton Act exempts trade unions, as such, from the provisions of the Sherman Act. But the Clayton Act does not exempt any specific action of trade unions. The mere act of joining or organizing a union is not a violation of the Sherman Act, but the act of preventing a non-union man from getting a job in a closed shop would assuredly, under the Washington ruling, be a violation. It seems clear to us that when Congress passed the Sherman Act it used the word 'trade' to cover the field of commercial activity. The idea that medical societies, bar associations, etc., might be classed as 'trade' groups never occurred to anybody until Thurman Arnold had the bright notion of prosecuting the A. M. A. because he disagreed with its opinion of group medicine. It will be a curious irony if the New Deal effort to dictate the professional standards of physicians should ultimately destroy a privilege sacred to labor unions."

The Detroit *Free Press* asks what is to become of the long established distinction between the trades and the professions and hints that such a decision might interfere with freedom of worship, because under this decision "competition among exponents of creed would become an activity subject to legal inquiry and regulation in case anybody should charge 'unfair trade practices' or efforts to 'create a monopoly.'" The Detroit *Free Press* continues "It may be assumed, too, that the practice of law, invention, art, and the creation of fine music, all do become trades, and subject to those legal restrictions that may be necessary in a degree for the regulation of industry, business and commerce, but are bound to be deadly if applied to endeavor that is basically individual and creative."

The editorial which appeared simultaneously in the Washington, D. C., *Times* and in the Indianapolis *Times* is devoted primarily to an attack on the unions and says that the doctors and the carpenters seem to be in the same boat. This editorial attacks particularly the leaders of union labor and, by implication, leaders in the field of medicine, arguing that Mr. Arnold is not interested in attacking the workers but only in attacking their leaders. This is the same type of philosophy which says that it is not the German people with whom England is at war but only Hitler.

A final editorial from the *Daily Idahonian*, published in Moscow, Idaho, uses the whole incident in a manner which will hardly give aid and comfort to Mr. Arnold or any one else who is interested at all in the

quality of medical service. This editorial says "Similarly certain types of healers are barred from most hospitals. Why they should be is something the average layman has never been able to understand. Why osteopaths or chiropractors should be refused the right to hospitalize their patients in buildings endowed by philanthropists for the public good, or built with public funds or through public subscription, is without logic or sane reasoning."

No doubt those who have been primarily concerned in breaking down established order in the field of medicine, and who care little or not whether the high standards of medical service which now prevail are wrecked, are rejoicing in this appeal that the hospitals be opened without restraint to every half-educated medical pretender and charlatan.

SCIENCE AND SAL HEPATICA

If you listen to Fred Allen on Wednesday nights, and apparently a good many people do, you will hear his announcer make some comments about the scientific research conducted by leading medical magazines which indicate that a high percentage of doctors always prescribe a saline laxative when treating a common cold. Of course the names of the leading medical magazines are not given; yet it would not be hard to guess the name of the commercial publication that conducted this survey for the Bristol-Myers Company.

Part of the scientific story is the claim that Sal Hepatica is the "mineral salt laxative that does two things, not just one; it rids the body of waste and it also combats acidity." The history of Sal Hepatica is a strange commentary on the kind of science that used to be sold to credulous Americans. In 1911 Sal Hepatica was advertised as a uric acid solvent, said to be indicated in stomach, liver and kidney disorders, and especially beneficial in rheumatism and gout. In 1916 it was promoted because it was said to be useful in the treatment of pyorrhea. By 1929 it was called the American equivalent of European spas, and listeners were told that it was good also for headaches, colds, rheumatism and autointoxication. Actually there is nothing to Sal Hepatica according to recent analyses except Glauber's salt, baking soda and tartaric acid, common salt, sodium phosphate, a trace of lithium carbonate and water. Any doctor knows what that is good for and a variety of conditions which it is not good for.

Quite recently Sal Hepatica has gone exceedingly high hat. In an advertisement in *Drug Topics* the druggists are told that "scientific research on Sal Hepatica never relaxes; research men continually put it through its laboratory and clinical paces. New findings are brought to the attention of practically every physician, dentist, nurse, and osteopath in the country." Here obviously is a product which is prescribed, according to its promoters, not only by physicians but by dentists, nurses and osteopaths.

Among the advertisements which the company offers to the kind of professional publications that will carry them is one dealing with the high incidence of a condition called "feter ex ore," in relation to which it is said that "clinical studies have shown that the waste-laden colon may readily be the causative factor in offensive breath." Whose clinical studies?

Somewhat the whole set-up, including the questionnaire to the doctors conducted by the "leading medical magazine," the scientific research and the advertisements, seems to be best described in the word that the company features in its latest advertisement. Bristol-Myers found a word for it, and that word is "feter."

Current Comment

FURTHER COMMENTS BY THE COURTS ON BRINKLEY

In the decision rendered by the United States Circuit Court of Appeals in New Orleans by Circuit Judges Foster, Hutcheson and McCord, certain statements were made relative to the practice of John R. Brinkley which deserve repetition. The statement prepared by Circuit Judge Foster begins by pointing out that the defendant pleaded the truth of the statements of fact in the article, that the opinions were based on facts and are reasonable, and that the publication is privileged under the law of Texas. In the appeal Brinkley's attorneys offered thirty-two assignments of error. Concerning these the court said that the evidence of the plaintiff, who was placed on the stand by the defendant, tended to show the truth of the statement of facts complained of. Furthermore, the court stated that it could find no substantial evidence tending to show that the defendant was actuated by malice. The remainder of the statement of Circuit Judge Foster is given in toto for the light that it casts on the court's opinion of Brinkley's methods of practice:

The gist of the article complained of is the charge that plaintiff is a charlatan. A charlatan is defined as "one who pretends to more knowledge or skill than he possesses, especially in medicine; a quack." A quack is defined as "an ignorant or fraudulent pretender to medical skill" and an element of quackery is "to advertise or urge, as a quack does his remedies." See Century Dictionary, "charlatan" "quack."

The admissions of plaintiff in his testimony tend to show that he obtained his medical degree from an institution known as a diploma mill; that he had been practicing medicine since 1915; that he began practicing medicine in Milford, Kansas, in 1917; that he advertised, by pamphlets and newspapers and by radio broadcasting from his own station, an operation for transplanting goat glands in men for the purpose of sexual rejuvenation; that he had treated between 5,000 and 6,000 persons and he charged some of them nothing and some of them \$750 for the operation; that his gross income was about \$100,000 per month; that he abandoned this practice in 1933; that his license to practice medicine in Kansas was revoked in 1930 and his radio license was revoked by the Federal Communications Commission in 1930; that a license he had obtained to practice medicine in Connecticut was revoked; that he was indicted in California for a conspiracy to unlawfully practice medicine; that at the time the article was written he was advertising, by radio broadcasting from a Mexican station, his

skill in treating prostatic troubles; that he would prescribe by letter for persons who wrote to him describing their symptoms, for which he charged \$2.

All learned professions have their standards of ethics. A lawyer who advertises and gives advice by mail without seeing his client would certainly be considered a shyster. There is no doubt whatever that plaintiff by his methods violated accepted standards of medical ethics.

We think above stated facts are sufficient to support a reasonable and honest opinion that plaintiff should be considered a charlatan and quack in the ordinary, well understood meaning of those words. We conclude this was a matter of public concern and the articles were published for general information. Therefore, the publication is privileged.

In the light of this statement by the United States Circuit Court of Appeals, one may well wonder how long the Post Office Department will continue to hesitate.

PROGRESS IN THE SELENIUM PROBLEM

The development of our knowledge of selenium and the importance of this information in relation to economic problems and to public health have been recorded here at intervals.¹ Moxon and Du Bois,² at the South Dakota Agricultural Experiment Station, have now determined the influence of various chemical elements on the toxicity of selenium-containing grains. These investigators demonstrated that arsenic, in the form of sodium arsenite, administered in the drinking water in a concentration of 5 parts of arsenic per million, was effective in completely preventing the symptoms of selenium poisoning, i. e., inhibited growth and extensive liver damage. The same level of tungsten, in the form of sodium tungstate supplied in the drinking water, was only partially effective in preventing the typical liver damage caused by the selenium-containing diet but appeared to decrease the mortality of the rats. Fluorine, molybdenum, chromium, vanadium, cadmium, zinc, cobalt, nickel and uranium salts caused an increase in mortality. The effectiveness of arsenic is reminiscent of the ability of aluminum salts to nullify the undesirable effects of the ingestion of fluorine salts and is suggestive of a direct action of arsenic on the absorption of selenium from the gastrointestinal tract. The solution of the problem of the chemical nature of the selenium-containing constituent of seleniferous grains now appears to be at hand. In a preliminary report, Horn and Jones,³ of the United States Department of Agriculture, have announced the isolation of a crystalline, selenium-containing amino acid from hydrolysates of seleniferous grains. The empirical formula of the compound suggests a structure similar to that of the sulfur-containing amino acid cystine. Indeed, the isolated product appears to be closely associated with a sulfur-containing amino acid in the grain. The close chemical relationships of selenium and sulfur indicate interesting problems in the mode of biologic synthesis of the selenium-containing amino acid, its physiologic effects, and its metabolism in the mammalian organism.

1. The Selenium Problem, editorial, J. A. M. A. **104**: 50 (Jan. 5) 1935; Toxic Effects of Selenium, Current Comment **106**: 926 (March 14) 1936; Selenium Content in Wheat, **107**: 134 (July 11) 1936; The Possibility of Human Selenium Poisoning, **108**: 210 (Jan. 16) 1937.

2. Moxon, A. L., and Du Bois, K. P.: J. Nutrition **18**: 447 (Nov.) 1939.

3. Horn, M. J., and Jones, D. B.: J. Am. Chem. Soc. **62**: 234 (Jan.) 1940.

ORGANIZATION SECTION

ALLOCATION OF FEDERAL FUNDS TO STATES

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CHICAGO

Grants of funds from one state or government to another or to private persons, companies or corporations for a wide variety of purposes have been known for several hundred years. Grants have been made to assist in the establishment or support of an enterprise deemed advantageous to the public, in aid of different forms of transportation or other public utilities, as a simple gift or an amount in excess of the usual charges for services, or to aid in establishing or maintaining a service or equipment larger or more powerful than the state of trade would warrant. Such funds were often provided formerly in accordance with a treaty, sometimes to secure neutrality, but more frequently to meet the expenses of carrying on a war.

More recently in the United States, efforts have been made almost continuously to have the federal government assume many activities and a considerable portion of the costs which were formerly conducted and supported solely by local and state governments. Justification for the use of federal funds is claimed for the construction and maintenance of highways under the constitutional authority of the federal government over interstate commerce and over post roads. The programs toward the eradication of the European corn borer, the pink boll weevil and other pests which endanger plants and animals are claimed to be proper activities to be supported by federal funds or grants, since they are within the limits of the normal federal control of interstate commerce by controlling such diseases at their points of propagation. Prevention of forest fires, in cooperation with the states, may justify the use of federal funds to safeguard from fire the forests owned by the federal government.

Many will recall the controversy that raged in 1921 over the use of federal funds for activities in the field of maternity and infancy under the title of the Shepard-Towner act, and again in 1927 when that act was continued in force for two years more.

The principle of grants-in-aid to states was again brought into operation through the provisions of the Social Security Act of 1935, and this was also the principle underlying the method of development of a considerable part of the Wagner health bill of 1939.

It is not proposed to enumerate here all the purposes for which federal funds have been made available for grants-in-aid to states or to list all the payments to states each year under provisions of the several federal acts. Since the philosophy of grants-in-aid has become prevalent in federal legislation it has been necessary for most states to enact laws to provide funds and methods of administration which would enable them to qualify for federal allotments.

The results have been apparent. The benefits that have come through the expenditure of the combined federal-state funds have often been accompanied by an additional strain on the tax structure of the state and have always been accompanied by an unavoidable amount of federal participation in and control of the proposed programs.

The most extensive federal grant-in-aid program that has yet been developed in the field of medicine is to be found under several titles of the Social Security Act. Titles I, Old Age Assistance, IV, Aid to Dependent Children, III, Unemployment Compensation, and X, Aid to the Blind, only indirectly have some bearing on medicine, since theoretically these titles are supposed to enable the recipients to be provided with the necessities of life. However, titles V and VI have the direct purpose to enable states to furnish services for the promotion of the health of mothers and children, surgical and hospital care of crippled children, the vocational rehabilitation of the physically disabled and the organization and maintenance of public health services.

The expenditure of federal funds through grants-in-aid under the several titles of the Social Security Act for the fiscal year ended June 30, 1938, was \$275,000,629.80. The amount estimated to be necessary for the year ended June 30, 1939, was \$323,000,000 and for the fiscal year ending June 30, 1940, for the same purposes, \$343,150,000.

For the fiscal year ending June 30, 1939, the grants to and expenditures within thirty-seven states and the District of Columbia exceeded and in sixteen states were less than the total internal revenue collections. Information is not available to show in detail the purposes for which these grants and expenditures were made or what proportion of the total amount of \$4,393,927,000 was grants and what proportion constituted some other type of funds.

For the fiscal year ended June 30, 1939, the payments to states under title VI, section 601, of the Social Security Act, Public Health Work, totaled \$7,985,119.61.

In the three years and five months since funds first became available under title VI of the Social Security Act, \$27,333,000 has been appropriated by the Congress for grants-in-aid to the states for public health work.

On Jan. 1, 1939, annual appropriations for health work, in the cooperative projects alone, from local and state sources totaled \$44,861,322, an increase of more than \$13,000,000 in four years.

The allotments of funds to states in the development of the syphilis program of the U. S. Public Health Service were derived from the Deficiency Appropriation Act, Public No. 723, Seventy-Fifth Congress. Of the \$3,000,000 appropriated for this purpose for the fiscal year ended June 30, 1939, \$2,400,000 was allocated to the states. Of the \$5,000,000 appropriated by the regular appropriation act, Public No. 65, Seventy-Sixth Congress, for the fiscal year ending June 30, 1940, for this purpose an estimated \$4,000,000 has been allocated to the states, territories and insular possessions.

The allotments to states for public health work and for the syphilis program are made through the Public Health Service, Federal Security Agency.

The allotments of funds to states for Maternal and Child Health Services, title V, part 1, Crippled Children, title V, part 2, and Child Welfare Services, title

V, part 3 of the Social Security Act, are made through the Children's Bureau, Department of Labor.

At the beginning of the fiscal year 1939, an amount of \$4,707,734.60 was available for the purposes of title V, part 1, Social Security Act, for maternal and child health services. These available funds were allotted under funds A and B. Allotments under fund A were of two types—uniform allotment \$1,020,000 and allotment on the basis of live births in the state to total live births \$1,800,000. Fund B was allotted on the basis of need for assistance in carrying out state plans after the number of live births was taken into consideration—the amount thus allotted was \$980,000. The term “state” includes Alaska, District of Columbia and Hawaii. The amount of federal funds budgeted in state plans as approved, for 1939, was \$4,409,751.69. Of these budgeted funds only \$3,724,362.29 was paid to the states, \$2,744,362.29 from fund A and \$980,000 from fund B.

At the beginning of the fiscal year 1939, a total of \$4,176,690.74 was available for services for crippled

Grants-in-aid are always accompanied by some rules, regulations and standards of administration. The rules and regulations constitute a leveling process by which direction and control are centralized, local control and autonomy are lost, and each part of the country which accepts grants-in-aid funds is required to fit the same federal mold; standards are usually minimum and when applied to the distribution of medical services actually may operate as a secondary system of licensure.

Initiative disappears and individual and community responsibility are ignored and discouraged by a not too cleverly veiled assumption of superiority and usurpation of power.

Too often grants-in-aid, temptingly offered, induce states and many communities within their boundaries to extend themselves in the organization of services and facilities far beyond their ability to maintain.

Financing by means of grants-in-aid usually follows a fairly rigid pattern. Although many administrators of such combined funds use good judgment in the application of the funds to the best purpose, the possibility of development by experimentation is often largely eliminated.

It has occurred in recent years in the development of federal programs, extended through grants-in-aid, that lobbyists from some federal agency have endeavored to influence state legislatures in the passage of a particular, ready-made bill to enable the state to qualify with certainty for the federal grants. Such tactics most assuredly extend the influence of the centralized government into every part of the nation.

In an address before the Society of the Daughters of the American Revolution, Washington, April 15, 1928, President Coolidge said:

There are always those who are willing to surrender local self government and turn over their affairs to some national authority in exchange for a payment of money out of the federal treasury.

Whenever they find that some abuse needs correction in their neighborhood, instead of applying a remedy themselves they seek to have a tribunal sent on from Washington to discharge their duties for them, regardless of the fact that in accepting such supervision they are bartering away their freedom. Such actions are always taken on the assumption that they are a public benefit.

Somewhere, Lincoln said something to the effect that tyrants always bestrode the necks of the people upon the plea that it was for their good. He might have added that the people suffered the rule of tyranny in the hope that it would be easier than to rule themselves.

We have built our institutions around the rights of the individual. We believe he will be better off if he looks after himself.

We believe that the municipality, the state and the nation will each be better off if they look after themselves. We do not know of any other theory that harmonizes with our conception of true manhood and true womanhood.

If the pattern of financing by federal grants-in-aid is to become a fixed part of the distribution of medical and health services, the medical profession should consider well the values that may be lost by the gradual usurpation of control by a central authority.

If significant losses are to be avoided, the medical profession must continue to take a sympathetic interest in the methods of distributing medical services as well as the development of the scientific methods of diagnosis and treatment. There is little reason to expect the legislative bodies that establish the policy of grants-in-aid to modify or abandon the policy as long as officials who administer the combined federal-state funds clamor for the federal grants.

*Federal Appropriations for Health and Welfare Services
Under Social Security Laws*

(Prepared by the Bureau of Legal Medicine and Legislation,
American Medical Association, Chicago, Aug. 23, 1939.)

Purpose of Appropriation	Total Approp- riations Made for Fiscal Year Ending June 30, 1940, to Carry Out Social Security Act, as Amended	Total Approp- riations Authorized for Each Fiscal Year by Social Security Act, as Amended
Grants to states for maternal and child health services (under the supervision and control of the Children's Bureau).....	\$1,800,000	\$5,820,000
Grants to states for services to crippled children (under the supervision and control of the Children's Bureau).....	3,350,000	3,870,000
Grants to states for child welfare service (under the supervision and control of the Children's Bureau)	1,505,000	1,510,000
Grants to states for public health work (under the supervision and control of the U. S. Public Health Service).....	9,500,000	11,000,000
Total appropriations for health and welfare services	\$19,155,000	\$22,200,000

children (title V, part 2), a balance from 1938 of \$1,326,690.74 and a new appropriation of \$2,850,000. These funds were allotted partly as a uniform allotment, \$1,020,000, and partly on the basis of need, taking into consideration the number of crippled children and the costs of service, \$1,830,000.

Federal funds budgeted in approved state plans amounted to \$3,436,065.71, of which the amount \$2,997,914.77 was paid to the states.

Funds available for child welfare services, title V, part 3, of the Social Security Act, for the fiscal year ended June 30, 1939, were \$2,225,799.21, of which \$725,799.21 represented a balance from the fiscal year 1938.

These funds were allotted partly by uniform allotment, \$510,000, and partly on the basis of the ratio of rural population in the state to total rural population, \$990,000.

The federal funds budgeted in approved state plans were \$2,147,608.11, of which \$1,520,893.74 was paid to the states during the year.

Impossible as it is to discuss here all the details and amounts of money involved in grants-in-aid during recent decades, certain tendencies that are frequent accompaniments of such methods of financing should not be overlooked.

ESSEX COUNTY (N. J.) MEDICAL SOCIETY'S MEDICAL WEEK

The Medical Exhibit recently sponsored by the Essex County Medical Society was designed as an educational project for the public, and it was eminently successful. The Essex County Dental Society and the New Jersey Pharmaceutical Association participated.

The funds for the exhibit, amounting to \$4,000, were provided by Ciba Pharmaceutical Products, Inc., of Summit, Schering Corporation of Bloomfield and Hoffmann-LaRoche, Inc., of Nutley. These companies helped in other ways, especially by the assembly of three exhibits—Vitamins, Ductless Glands and Menstrual Cycle—which were identical with those which these companies presented at the world's fair.

The exhibit represented the cooperative effort of the Essex County Medical Society as a whole. No individual doctor or hospital was expected to gain any publicity. Anonymity was preserved successfully and was carried to the extent of having physicians called over the loud speakers by numbers only. Wide-spread publicity was obtained by placards displayed in doctors' and dentists' offices and in pharmacies throughout Essex County; also by placards on public service buses, by newspaper accounts of various sections of the exhibit and by radio talks.

The actual conduct of the exhibit was in the hands of the Woman's Auxiliary. A total of 384 women donated not less than three hours' time during the week in order to staff the various units of the exhibit, to furnish information and to perform other functions. The actual demonstrations of laboratory technic, cardiography and basal metabolism were conducted by graduate nurses from the various hospitals (also anonymously) and by laboratory technicians. No physician appeared at any time to demonstrate the various units of the exhibit.

The exhibits consisted of thirty-three units. They included charts, diagrams, pathologic specimens, instruments of precision, surgical instruments and laboratory equipment. Actual demonstrations were made under the microscope of blood stains, bacteria, spirochetes and gonococci. Probably the most interesting from the lay point of view were the clinical laboratory exhibit, where many slides were visible under microscopes, the pneumonia exhibit, the anesthesia exhibit, the operating room, the maternity and child welfare exhibits and the vitamin, endocrine and menstrual cycle exhibits. Each individual unit of the exhibit was in charge of a subcommittee which attended to details of the assembly of its unit.

The moving picture program, which was on continuously from noon to 8 p. m., played to "standing room only" throughout the week.

The speakers were from out of town, with one exception, and that one is not engaged in private practice. They included:

Dr. Howard W. Haggard, New Haven, Conn., Medical Change and Social Change.
Dr. Grant Thorburn, New York, Tuberculosis.
Dr. Charles Hendee Smith, New York, Health Habits for Children.
Dr. Paul Padgett, Baltimore, The Layman's Part in Syphilis Control.
Dr. Harrison S. Martland, Newark, N. J., Medical Detection of Crime.
Inspector E. P. Coffey, Federal Bureau of Investigation, Washington, D. C., Scientific Crime Detection.
Florence B. Hopkins, M.D., D.M.D., Boston, Dentistry in Its Relation to Health.

The speakers addressed capacity audiences each night. The total recorded attendance was 40,350 persons.

The exhibit demonstrated an immense interest in medical matters and the consensus was that the Essex County Medical Society gave them a wonderful educational opportunity.

The Nutley *Sun* editorialized about the exhibit in part as follows:

A Better Understanding

"The Essex County Medical Society has made a valuable contribution to bringing about a better understanding and relationship between the medical profession and the public. Thousands visited the exhibit sponsored by the society in Newark last week. The layman was offered the opportunity through displays, motion pictures and lectures by prominent men in the profession to gain knowledge about which he was completely in the dark. Both the public and the profession gained through this type of educational program.

"One of the biggest tasks that face medical men is breaking down the layman's fear and ignorance of medical facts and problems. Exhibitions such as those sponsored by the Medical Society will contribute greatly in spreading the doctrine that preventative measures which can be taken in medicine will go a long way toward eliminating suffering, unhappiness, big doctors' bills and a short life.

"The Essex County Medical Society has set an example for all of the profession to follow. It is in effect the laying of the groundwork for a new and better relationship between the physician and his patients. The popularity of the Newark exhibit should indicate to physicians that there are many of the public who are eager to learn more about medical problems. To the public it should demonstrate that there is a willingness and an eagerness on the part of doctors to become advisers and educators."

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—The Senate Committee on Education and Labor held hearings March 18 on S. 3230, the bill introduced by Senator Wagner, for himself and Senator George, to promote the national health and welfare through appropriation of funds for the construction of hospitals.

Bills Introduced.—S. 3529, introduced by Senator Reynolds, North Carolina, proposes to authorize the Administrator of Veterans' Affairs to furnish domiciliary care and medical and hospital treatment to former members of the Army, Navy, Marine Corps or Coast Guard who were not dishonorably discharged therefrom and who served at least one enlistment period. S. 3579, introduced by Senator Walsh, Massachusetts, proposes to extend the federal old-age and survivors' insurance benefits of the Social Security Act to employees of corporations, community chests, funds, or foundations organized and operated exclusively for charitable, scientific, religious, literary or educational purposes, or for the prevention of cruelty to children or animals. H. R. 8128, introduced by Representative Voorhis, California, proposes to grant permanent and total disability ratings to veterans suffering from severe industrial inadaptability as a result of war service. H. R. 8823, introduced by Representative Shafer, Michigan, proposes to extend

the benefits of the United States Employees' Compensation Act to emergency-relief employees suffering from occupational diseases. H. R. 8918, introduced by Representative Thill, Wisconsin, proposes to authorize a federal income taxpayer to deduct amounts actually paid during the taxable year for the funeral and burial of the taxpayer's husband or wife, an individual, or a dependent for whom a credit is allowed under the law. H. R. 8915, introduced by Representative Gearhart, California, proposes to authorize an appropriation of \$2,000,000 to construct in one of the counties of Fresno, Kern, Kings, Madera, Merced, Stanislaus or Tulare, Calif., a veterans' hospital of 300 bed capacity, for the accommodation of veterans entitled to such facilities under existing and future law.

STATE MEDICAL LEGISLATION

Rhode Island

Bills Introduced.—S. 175 proposes to require an applicant for a license to practice any form of the healing art to present proof that he had successfully completed a satisfactory two year premedical course in a college properly accredited by the department of education to teach premedical subjects, prior to his enrolment in the professional college from which he is

graduated. H. 803 proposes to prohibit the issuance of a license to practice any form of the healing art to a graduate of a foreign school of the healing art unless such applicant is a citizen of the state.

Bill Introduced.—S. 203 proposes to authorize a sexual sterilization of inmates of state institutions afflicted with insanity, idiocy, imbecility, feeble-mindedness or epilepsy.

New York

Bills Introduced.—S. 1445, A. 1812 and A. 1842 propose to establish a system of compulsory and voluntary health insurance, the benefits of which are to consist of all forms of medical, dental, hospital and nursing care and treatment and stated cash benefits. S. 1451 and A. 1806, to amend the law requiring a public welfare district to provide necessary medical care for persons under its care and for such persons otherwise able to maintain themselves but who are unable to secure necessary care, proposes that the determination as to the medical care necessary for an eligible person must be made with the advice of a physician. A. 1815 proposes to permit the sale at retail or the furnishing of hypodermic syringes or hypodermic needles to podiatrists without the written order of a licensed physician or veterinarian, as the present law requires. S. 1520 and A. 1856, to amend Laws, 1938, c. 682, which declares the policy of the state with regard to the health of its inhabitants and creates a temporary state commission to study and recommend ways and means for carrying out such declared policy, proposes to authorize the commission in question to make an investigation, study and analysis of the general subject of care and hospitalization of persons suffering from tuberculosis. A. 1940 proposes to authorize the board of education in each city and

union free school district; and the trustee or board of trustees of a common school district, to employ such podiatrists as may be necessary to perform such duties, including health instruction, for the benefit of the public schools as may be prescribed by such board or trustees.

Bills Introduced.—S. 1801 proposes to make it a misdemeanor for any hospital, sanatorium, convalescent home or other place for the care and treatment of the sick and injured to refuse to administer emergency aid, treatment and care to any sick or injured person or to require any deposit, agreement or other act as a condition precedent to rendering such aid. A. 2017 proposes to grant relief clients the right to select the physician or dentist they desire to treat them. A. 2039, to amend the provisions of the medical practice act requiring licentiates before beginning to engage in the practice of medicine to register their licenses with the county clerk in the county in which they intend to practice, proposes that in counties comprised in the city of New York the registration fee shall be \$2.

Virginia

Bills Introduced.—H. 200 proposes that every doctor of medicine shall be required to obtain a revenue license. Every doctor of medicine who has been licensed for less than five years is to be required to pay \$10 and those who have been licensed and who have practiced for five years or more will pay \$15. The bill contains a proviso that every doctor of medicine who has been licensed for five years or more and who maintains an office in any community having a population of 5,000 inhabitants or more shall pay \$25, except that no doctor whose receipts from the practice of his profession were less than \$500 gross during the preceding year shall be required to pay more than \$10.

WOMAN'S AUXILIARY

Arkansas

The third district medical auxiliary met in Stuttgart October 26. Mrs. H. T. Smith, wife of the president-elect of the Arkansas Medical Society, gave plans for the observance of Doctors' Day. Miss Erle Chambers, executive secretary of the Arkansas Tuberculosis Association, spoke on "The Program of the Association in Arkansas" at the November meeting of the auxiliary to the Pulaski County Medical Society.

Mrs. L. H. Lanier discussed the National Health Program at a recent meeting of the auxiliary to the Miller-Bowie Counties Medical Society in Texarkana.

New York

Mrs. G. Scott Towne, president, auxiliary to the Medical Society of the State of New York, spoke at a recent meeting of the auxiliary to the Schenectady County Medical Society in Saratoga Lake. A project of the auxiliary to the Kings

County medical society is raising funds for the Physicians' Home. An auxiliary to the Fulton County Medical Society was organized in Johnston, November 21. Mrs. B. G. McKillip, Gloversville, was elected president.

Tennessee

The auxiliary to the Shelby County Medical Society assisted in the entertainment of members and guests who attended the meeting of the Southern Medical Association in Memphis November 21-24. Dr. Willis C. Campbell addressed members at the meeting of the auxiliary to the Shelby County Medical Society in Memphis October 18.

West Virginia

The auxiliary to the Raleigh County Medical Society met in Beckley October 30, with thirteen members present. The relation of the auxiliary to the medical society was discussed.

MEDICAL ECONOMIC ABSTRACTS

PACIFIC STATES MEDICAL EXECUTIVES' CONFERENCE

The third Pacific States Medical Executives' Conference was held in Seattle Dec. 10, 1939. Representatives were present from California, Idaho, Oregon, Washington, Montana and British Columbia. The conference aims only at a discussion of common problems with exchange of ideas, and it has no executive or legislative capacity. Charles Dukes, of Oakland, Calif., opened the discussion on care of the low wage group. W. W. Baum, of Salem, Ore., outlined the condition in Oregon for the care of the low wage group; V. W. Spickard, of Seattle, explained the Washington system. R. H. Fletcher, of the Washington State Department of Health, discussed the plan being generally followed in that state for the care of the indigent. Charles Wilson, of Portland, Ore., opened the discussion on postgraduate medical education. A. B. Hepler, of Seattle, stated that it was planned to establish in Washington a circuit of post-

graduate lectures each year and that it is proposed to establish a speakers' bureau listing those willing to present papers and clinics on various subjects. Among others, two representatives of the Farm Security Administration from Portland discussed the care of Farm Security Administration clients. It was brought out that no uniform program had been proposed by the Farm Security Administration for the care of the rehabilitation clients. Charles Hunt, of Eugene, Ore., described a professional society organized about eight years ago which comprises "a loose affiliation of medical men with physiotherapists, dentists, certified public accountants, graduate nurses, pharmacists, radiographers, veterinarians, and two groups of architects," based on the common need of maintaining and improving standards of all types of professional service.

Harry Rhodelamel was reelected president of the conference and Clyde Foley secretary. Portland, Oregon, was chosen as the permanent meeting place. About forty-one persons attended the conference.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Popular Medical Lectures.—The Stanford University School of Medicine announces the fifty-eighth course of popular medical lectures to be given at Lane Hall, San Francisco. The program is as follows:

Dr. Hans Lissner, April 5, Outstanding Achievements in Endocrinology.
Dr. Frederick A. Fender, April 19, Epilepsy and the Convulsive State: New Light on an Age-Old Problem.
Dr. Nelson J. Howard, May 3, Civilization's Challenge to Surgery: Recent Developments in the Treatment of Injury.
Dr. Eric Liljencrantz, May 17, Aviation Medicine.

Society News.—A panel discussion on hyperthyroidism constituted the program of the San Francisco County Medical Society, March 12, with the following speakers: Drs. Jesse L. Carr, Arthur L. Bloomfield, Jay Marion Read, Paul A. Gliebe, Frederick H. Rodenbaugh and Philip K. Gilman.—Dr. Ludwig A. Emge, San Francisco, addressed the San Diego County Medical Society, February 13, on "Reflections on Gynecological Procedures." Dr. Robert W. Langley, Los Angeles, discussed "Heart Sounds, a Clinical Experiment in Sound Photography," before the society, March 12.

Alumni Day.—The University of California Medical School, San Francisco, will hold its semiannual clinics for alumni and other physicians, March 27, to observe the university's seventy-second birthday. Clinics, demonstrations and ward rounds and the following lectures will make up the program:

Drs. Edward W. Twitchell, Paul A. Gliebe and Percy P. Poliak, Problems in Schizophrenia with Metrazol and Insulin.
Dr. Theodore Eric Reynolds, Oakland, History and Pharmacology of Sulfanilamide.
Dr. Salvatore P. Lucia, The Unusual Manifestation of Sulfanilamide Therapy.
Dr. John W. Brown, Applications of Chemotherapy in the Treatment of Pneumonia.

Herzstein Lectures.—The seventh course of Herzstein medical lectures will be delivered by David B. Dill, Ph.D., professor of industrial physiology, Harvard Medical School, Boston. The series is as follows:

April 8, High Temperatures. Racial and Individual Adaptability to Hot Climates; Various Types of Breakdown in Temperature Regulation; Clinical Applications of Hyperthermia.
April 10, Low Temperatures. Metabolic and Dietary Adjustments in Cold Climates; Dependence of Resistance on the Internal Environment; Clinical Applications of Hypothermia.
April 12, High Altitudes. Respiratory Adaptations to Oxygen Lack.

The lectures, which will be given in the auditorium of the University of California Extension Division, San Francisco, are delivered on alternate years under the direction of the medical schools of Stanford University and the University of California.

DELAWARE

Society News.—A symposium on bronchiectasis was presented before the New Castle County Medical Society, February 20, in Wilmington by Drs. Lawrence D. Phillips, Marshallton, Lewis B. Flinn and William M. Pierson. The guest speaker was Dr. Adrian van S. Lambert, New York, who discussed "The Surgical Aspects of Bronchiectasis." Dr. Joseph McFarland, Philadelphia, addressed the society, January 16, on "The Experimental and Clinical Evidence of Heredity in Malignant Disease."

DISTRICT OF COLUMBIA

Course in Aviation Ophthalmology and Aviation Medicine.—A postgraduate course in aviation ophthalmology and aviation medicine for graduates in medicine will be conducted at the George Washington University School of Medicine, Washington, April 1-6. Among the subjects covered will be:

Physiologic Problems Incident to Military and Commercial Flying.
Vision and Accommodation.
Motility of the Eye.
Stereopsis and Depth Perception.
The Fundus of the Eye.
Cardiovascular System in Aviation.
Refraction as Applied to Aviation.
Psychologic Aptitude as Applied to Aviation.
Physiologic Effects of Altitude Flying.
Fatigue.
The Human Element in Airplane Crashes.

Additional information may be obtained from the university, 1335 H Street N.W., Washington.

GEORGIA

Personal.—Dr. Henry C. Frech Jr., Savannah, has been appointed assistant director of maternal hygiene at the Chatham-Savannah health department, and Dr. Ruskin King, Savannah, assistant director of infant hygiene.—Dr. Thomas C. Davison, chief of surgical service at Grady Memorial Hospital for more than thirty years, has resigned.

Conference on Syphilis Control.—The U. S. Public Health Service called a conference, February 13-14, in Atlanta to consider problems connected with syphilis control in the Southern states, with Dr. Thomas Parran, surgeon general, presiding. States represented were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, Oklahoma, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia and the District of Columbia.

Changes in Public Health Personnel.—The state department of public health announces the following changes in personnel effective January 1: Dr. Abram J. Davis, Waynesboro, formerly commissioner of health of Burke County, has been appointed regional medical director of the East Central Health Region. Dr. Wilbur D. Lundquist, formerly of Lodi, Calif., who recently completed a course of training in public health administration, will succeed Dr. Davis as commissioner in Burke County. Dr. Oscar Emerson Ham, Atlanta, has been appointed commissioner of health of Bartow County and Dr. Charles R. Smith, Morgan, to a similar position in Calhoun County. Dr. George M. Anderson, Eastman, has resigned as commissioner of health of Dodge County. Dr. James A. Thrash, Columbus, has been appointed in charge of a combined city-county health department established in Columbus and Muscogee County.

ILLINOIS

The State Needs Physicians.—There are vacancies on the medical staffs of the state hospitals for the insane and feeble-minded under the jurisdiction of the state department of public welfare. Physicians enter the service in the classification of junior physician. Requirements include legal residence in Illinois, citizenship in the United States, graduation from a class A medical school and a license to practice medicine in the state. The salary for junior position is \$150 each month with full maintenance for self and family. If no civil service examination is pending, the applicant may be appointed and will be required to take the next examination for the position which is scheduled by the state civil service commission. Advancement to the higher classifications of senior physician, clinical director and assistant managing officer is provided through promotional examination. The salary range for senior physician is from \$195 to \$210 a month. For clinical director, the salary range is from \$250 to \$300 a month. Assistant managing officers in institutions with a population of less than 2,500 patients receive from \$218.33 to \$243.33 a month, and in institutions with more than 2,500 patients, from \$243.33 to \$268.33 a month. Maintenance for self and family is provided in all these positions. Opportunities for graduate training in psychiatry while employed in the state service have been provided and will be augmented when the additional wards and research facilities in the new psychiatric institute are made available in the near future. Some residencies in psychiatry are also available in the state hospitals for the insane. The salary is \$52.50 a month with maintenance for self only. Applicants should communicate with Mr. A. L. Bowen, director, state department of public welfare, Springfield, for further information.

Chicago

Tri-Chapter Banquet.—Dr. William F. Braasch, Rochester, Minn., will be guest speaker at the annual Tri-Chapter banquet of Alpha Kappa Kappa Fraternity at the Chicago Athletic Club April 3. His subject will be "Future Trends in Medicine." Dr. Herman L. Kretschmer will serve as the toastmaster.

Branch to Discuss Quackery.—The next meeting of the North Shore Branch of the Chicago Medical Society will be addressed at the Sovereign Hotel, April 2, by Drs. Paul C. Barton, director, Bureau of Investigation, American Medical Association, on "Quack Remedies"; Josiah J. Moore, "Cancer Quackery," and Mr. A. M. Simons, assistant director, Bureau of Medical Economics, American Medical Association, "Medical Economic Quackery."

Society News.—The Chicago Gynecological Society was addressed, March 15, by Drs. William F. Mengert, Iowa City, on prolapse of the umbilical cord and Philip H. Smith, Evanston, Ill., on hysterectomy.—The Chicago Society of Internal

Medicine will be addressed, March 25, among others, by Dr. Ernst Gellhorn, L. Yesnick, M.S., and Chester W. Darrow, Ph.D., on "The Role of the Carotid Sinus in Experimental Convulsions."—Dr. Henry H. Kessler, Newark, N. J., among others, addressed the Chicago Orthopaedic Society, March 8, on "Amputations and Prostheses."

The Bernard Portis Fellowship.—The establishment of the Bernard Portis Research Fellowship Fund in Surgery at the Michael Reese Hospital has been announced. The object of the fund, which provides \$1,000 annually for a full time fellow, is to arrange research training in surgery for young men who have had basic and fundamental training in surgery. Graduates of recognized medical schools who have had internships in approved hospitals will be considered. Applicants should submit their problems in writing, together with an estimate of facilities and supplies needed, to Dr. Sidney A. Portis, secretary of the newly formed fund. Dr. Bernard Portis died Nov. 1, 1939.

INDIANA

Courses in Obstetrics and Pediatrics.—A postgraduate course in obstetrics is under way in Boone and Hendricks counties under the auspices of the county medical societies in cooperation with the bureau of maternal and child health of the state board of health. The first three meetings were held in Danville; the last three are planned for Lebanon, with the series closing April 4. Dr. Carl P. Huber, research director in obstetrics and gynecology, Indiana University School of Medicine, Indianapolis, is in charge of the course. The state medical journal announces a course in pediatrics for the general practitioner. The course opened March 20 and will continue until April 10. Details may be obtained from the postgraduate education committee of the school of medicine, Indianapolis.

KENTUCKY

Regional Meeting.—The Eastern Kentucky Medical Association held a meeting in Paintsville, February 23, under the auspices of the Johnson County Medical Society. The speakers were:

Dr. Irvin Abell, Louisville, The Bleeding Uterus.

Dr. William W. Nicholson, Louisville, Sulfapyridine in the Treatment of Pneumonia.

Dr. Ray M. Bobbitt, Huntington, W. Va., Clinical Aspects of Nephroposis.

Dr. Edwin J. Humphrey Jr., Huntington, Studies in Sterility.

Dr. John M. Emmett, Clifton Forge, Va., Symptoms and Treatment of Goiters in General.

Dr. Arthur T. McCormack, Louisville, We Doctors.

MICHIGAN

Physician Honored on Retirement from Hospital.—A dinner was held in the University Club, February 10, to honor Dr. Robert T. Tapert, who has retired as chief of staff of the Deaconess Hospital, Detroit, after holding the position for twenty-one years. A portrait of Dr. Tapert, painted by Roy C. Gamble, was presented by Dr. Rudolph L. Pfeiffer, chief of staff, and accepted on behalf of the hospital by Dr. John L. Ernst, superintendent; it will be hung in the hospital. Malcolm W. Bingay, editorial director of the *Detroit Free Press*, was toastmaster at the dinner. Dr. Tapert will continue in private practice.

Tri-State Medical Association.—The sixty-seventh annual meeting of the Northern Tri-State Medical Association will be held in Battle Creek, April 9. The following will speak:

Dr. George J. Curry, Flint, Management of Long Bone Fractures.

Carl J. Klemme, Ph.D., West Lafayette, Ind., Relationship Between Sterols, Cardiac Poisons, Vitamin D, and Sex Hormones.

Dr. David Slight, Chicago, Migraine.

Dr. Thomas E. Jones, Cleveland, Diverticulitis of the Colon.

Dr. Louis J. Hirschman, Detroit, Fistula-in-Ano—Its Present-Day Treatment.

Dr. Vincent J. O'Connor, Chicago, Prostatic Diseases.

Dr. Fred L. Adair, Chicago, Pyelitis and Pregnancy.

Dr. James B. Costen, St. Louis, Neuralgias and Trismus Resulting from Mandibular Joint Disturbance.

The banquet at Battle Creek Sanatorium will be addressed by Dr. Walter C. Alvarez, Rochester, Minn., on "The Patient Who Is Always Ailing in Spite of Many Treatments."

Society News.—Ernest Fullerton Cook, Pharm.M., Philadelphia, discussed "Notable Developments in the Pharmacopoeial Program" before the Detroit Retail Druggists' Association and the Wayne County Medical Society, Detroit, February 19. A general meeting of the county medical society was addressed, March 4, by Dr. Madge Thurlow Macklin, London, Ont., on "The Role of Inheritance in Cancer in Man,

and Its Practical Applications."—Dr. Donald C. Beaver addressed the Highland Park Physicians' Club in Detroit, February 1, on "Pathology of Jaundice."—At a meeting of the Detroit Academy of Surgery, February 8, Dr. James Spencer Speed, Memphis, Tenn., spoke on "Treatment of Fractures by Internal Fixation." The meeting was called the "Frank B. Walker Memorial Meeting" in honor of the academy's second president, whose career was reviewed by Dr. Alexander W. Blain.—Dr. Henry Allen Moyer, state commissioner of health, Lansing, discussed preventive medicine before the Muskegon County Medical Society, Muskegon, February 16.—Dr. F. Janney Smith, Detroit, discussed pneumonia before the Jackson County Medical Society, Jackson, February 20.

NEBRASKA

Professor of Ophthalmology Appointed.—Dr. Louis B. Bushman, professor and director of the department of ophthalmology at Creighton University School of Medicine, Omaha, has been made professor emeritus and Dr. Charles M. Swab, associate professor, has been appointed to succeed him, according to the *Nebraska State Medical Journal*. Dr. Bushman graduated from Creighton University School of Medicine in 1903 and has been a member of the faculty since 1906 and professor of ophthalmology since 1919. Dr. Swab graduated from Creighton in 1916.

Society News.—Drs. Alan R. Moritz, Boston, and Sumner L. S. Koch, Chicago, addressed the Omaha-Douglas County Medical Society, Omaha, February 27, on "Medicine and the Administration of Justice" and "Management of Surgical Wounds" respectively.—Drs. George W. Covey and George H. Misko, Lincoln, addressed the Lancaster County Medical Society, Lincoln, February 6, on "The Cyanates in Arterial Hypertension" and "Fever Therapy" respectively.—Speakers at a meeting of the Five-County Medical Society in Wayne, February 6, were Drs. Lucien Stark and Albert J. Schwedhelm, Norfolk, on "Rheumatic Heart Disease" and "Cancer of the Rectum and Sigmoid" respectively.

NEW JERSEY

Course on Allergy.—A series of lectures on allergy is being presented by the Bergen County Medical Society at Teaneck. Dr. Marion B. Sulzberger gave the first lecture, March 7, on "Treatment of Eczema in General Practice"; Dr. Robert Chobot, March 14, "Management of the Allergic Child" and Dr. Russell C. Grove, March 21, "Importance of Nose and Throat Infection in the Treatment of Asthma." Coming lectures will be:

Dr. William C. Spain, March 28, The Skin Sensitive Type of Asthma.

Dr. Albert Vander Veer, April 4, Hay Fever.

Dr. Matthew Walzer, April 11, Food Allergy.

All the speakers are from New York.

Society News.—A symposium on obstetrics was presented at a meeting of the Bergen County Medical Society in Teaneck, March 12, by the following speakers, all of Brooklyn: Drs. Harvey B. Matthews, who discussed "Indication for Forceps"; Henry S. Acken Jr., "Indications for Cesarean Section"; Martin Z. Glynn, "Postpartum Hemorrhage," and Willard G. French, "Treatment of Eclampsia."—Dr. Frank E. Adair, New York, addressed the Atlantic County Medical Society, Atlantic City, March 8, on therapy of breast conditions.—Dr. George Harlan Wells, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, March 21, on "Causes and Treatment of Congestive Heart Failure."

NEW YORK

Society News.—Dr. Robert T. Frank, New York, addressed the Nassau County Medical Society, Garden City, February 27, on "Endocrinology in the Female."—Drs. Samuel A. Thompson and Milton J. Raisbeck, New York, discussed operative and medical management, respectively, of "Surgical Treatment of Coronary Disease."—The winter meeting of the Madison County Medical Society was held in Oneida, January 18, with the following speakers, all of Syracuse: Drs. Sydney W. Stringer, on "The Vaginal Discharge"; Leon E. Sutton, "Early Local Care of Traumatic Wounds, with Special Reference to Wounds of the Face," and Earle E. J. Mack, "Vitamin Deficiencies."—Dr. Israel Davidsohn, Chicago, addressed the Buffalo Academy of Medicine, February 28, on "Infectious Mononucleosis."—Dr. Orren D. Chapman addressed the Syracuse Academy of Medicine at a joint meeting with Alpha Omega Alpha, March 19, on "Oral Infection with Special Consideration of Fusospirochetal Disease."

New York City

Medicomilitary Meetings.—The Medical Executive of the Second Military Area, U. S. Army, sponsored a meeting for Medical Department reserve officers, March 4, at the Federal Building with the following speakers: Lt. Col. Orville E. McKim, Veterinary Reserve, on "Veterinary Food Inspection; Its Importance and Responsibility"; Lt. Col. William A. Hardenbergh, Sanitary Reserve, "Sanitation in the Field," and Lt. Col. Robert K. Simpson, Medical Corps, in charge of aviation medicine at Mitchel Field, L. I., "Physical Examination of Applicants for Appointment as Flying Cadet, U. S. Air Corps." Each speaker arranged an exhibit in addition to his address. A dinner will be held Saturday evening, April 6, at the Town Hall Club, with Col. Frank W. Weed, surgeon, Second Corps Area, as the guest of honor. Col. John L. Kantor, Medical Reserve Corps, will serve as toastmaster.

Prize Awarded to Dr. Sawyer.—The Léon Bernard Prize of a bronze medal and 1,000 Swiss francs, established by the Health Committee of the League of Nations, was awarded for the first time, January 29, to Dr. Wilbur A. Sawyer, director of the International Health Division of the Rockefeller Foundation. The presentation was made by Dr. Hugh S. Cumming, former surgeon general of the U. S. Public Health Service, at a dinner of the League of Nations Association in New York as a tribute to Dr. Sawyer's achievements in control of yellow fever and to his success in extending medicosocial protection to the populations of many countries, according to *Science*. The award was created by the Health Committee in memory of Professor Bernard, a prominent member who died in 1934, to reward practical achievements in the field of social medicine. Professor Bernard was for many years general secretary of the International Union Against Tuberculosis.

NORTH CAROLINA

New Mental Hygiene Appointments.—Dr. James Watson, recently a member of the staff of the Worcester State Hospital, Worcester, Mass., has been appointed director of the mental hygiene division of the state board of charities and public welfare. Dr. Watson graduated from Northwestern University Medical School, Chicago, in 1925 and spent several years as medical superintendent of the Ryder Memorial Hospital, Humacao, Puerto Rico. Later he was on the staff of the Elgin State Hospital, Elgin, Ill. Dr. Richard F. Richtie, formerly of Lincoln, Neb., has been appointed assistant director of the division in charge of the children's unit, according to the *North Carolina Medical Journal*.

Society News.—Dr. Claude N. Burton addressed the Buncombe County Medical Society, Asheville, February 19, on panhysterectomy.—Dr. Foster Kennedy, New York, addressed a joint meeting of the Forsyth and Guilford county medical societies in Winston-Salem, recently, on "The Organic Background of Mind."—At a meeting of the Catawba Valley Medical Society, Lincolnton, March 14, the speakers were Drs. Allison L. Ormand Jr., Black Mountain, on "Early Diagnosis of Pulmonary Tuberculosis"; Samuel A. Wilson, Lincolnton, "Use of Silver Picrate in the Treatment of Gonorrhea," and Cyrus L. Walton, Glen Alpine, "Treatment of Rheumatism and Arthritis by the General Practitioner."

PENNSYLVANIA

New Members of State Medical Board.—Gov. Arthur H. James recently appointed the following new members of the state board of medical education and licensure: Dr. John E. James, Philadelphia, to succeed Dr. George Willis Hartman, Harrisburg; Dr. Charles L. Shafer, Kingston, to succeed Dr. William C. Bryant, Pittsburgh, and Dr. Charles J. Hemminger, Somerset, to succeed Dr. Domer S. Newill, Connellsville. Dr. Irvin D. Metzger, Pittsburgh, was reappointed.

Philadelphia

Campaign for \$4,000,000.—Philadelphia opened its 1940 campaign for funds for charitable agencies February 26. The annual effort, formerly called the United Campaign, is now known as the United Charities Campaign. The 137 organizations for which support is sought include twenty-one hospitals, twenty-one health groups, eight associations for rehabilitation of families, twenty-two for assistance to families and forty-two for youth training and development. A budget of four million dollars is the objective for this year.

Auxiliary Sponsors Health Institute.—The Woman's Auxiliary of the Philadelphia County Medical Society will present its tenth annual health institute at the society's build-

ing April 9. Included in the program will be the following speakers:

Dr. Baldwin L. Keyes, Environment and the Child.
Dr. Burgess L. Gordon, Results of Education in Environment.
Dr. Stanley P. Reimann, Heredity and Disease.
Dr. Joseph C. Yaskin, Neuropsychiatry and Heredity.
Dr. Percy S. Pelouze, Education and the Social Diseases.
Dr. Charles Francis Long, Education for Industrial Health.
Dr. Dorothy Case Blechschmidt, Health Education and the Youth.
Mrs. Augustus H. Kech, field director, health education, state health department, Health Programs in Pennsylvania.

Society News.—Speakers at a meeting of the Philadelphia Roentgen Ray Society, March 7, were Drs. Howard H. Brashaw, on "Surgical Aspects of Bronchogenic Carcinoma," Herman W. Ostrum, "Roentgen Diagnosis of Pulmonary Malignancy," and Bernard P. Widmann, "Roentgen Therapy for Pulmonary Malignancy."—Dr. Robert D. Dripps Jr. and Martin Larrabee, Ph.D., among others, addressed the Philadelphia Neurological Society, February 23, on "Electrical Activity of the Cortex and Cortical Blood Flow Changes Induced by Metrazol and Other Exciting Agents."—Dr. Leandro M. Tocantins, among others, addressed the Philadelphia Urological Society, February 26, on "Hypoprothrombinemia and the Clinical Use of Synthetic Vitamin K Substitute."

Pittsburgh

Fourth Renziehausen Lecture.—Dr. Frederick M. Allen, New York, will deliver the fourth Renziehausen Memorial Lecture, April 2, at the Mellon Institute on "The Treatment of Diabetes."

Society News.—At a meeting of the Allegheny County Medical Society, March 19, the speakers were Drs. Joseph S. Baird on "Allergic Reactions in Modern Diphtheria and Scarlet Fever Antitoxin Therapy"; Henry J. Benz, "After Seventeen Years of Diphtheria Prevention"; Philip E. Marks, "Private Physician and Public Health"; George E. Martin, "Trend of Tuberculosis in Pittsburgh," and Mr. Thomas G. English, "The Purity of Water and How to Keep It That Way."

UTAH

Annual Registration Due April 1.—All practitioners of medicine and surgery licensed to practice in Utah are required to register annually on or before April 1 with the Department of Registration and to pay a fee of \$3. If a licentiate fails to reregister within ninety days to six months after April 1, his license can be revoked, and if revoked, it will be reinstated thereafter only on his paying the delinquent registration fees and an additional year's fee as a penalty.

WYOMING

Annual Registration Due April 1.—All practitioners of medicine and surgery licensed to practice in Wyoming are required by law to register on or before April 1 with the secretary of the Board of Medical Examiners and to pay a fee of \$2.50. If a licentiate fails to pay the fee within three months after April 1, his license can be annulled and, if annulled, it will be reinstated only on his paying the stated fee, plus \$5 as a penalty.

GENERAL

Annual Cancer Control Campaign.—The American Society for the Control of Cancer through the units of the Women's Field Army will conduct its fourth annual campaign of cancer education during April. It is expected that, as in previous years, President Roosevelt will issue a proclamation directing attention to the need to "Fight Cancer with Knowledge." Organized four years ago, the Women's Field Army now has divisions in forty-six states, with cancer information centers in more than half the counties in the country.

Grants Available from Plotz Foundation.—Applications for grants from the Ella Sachs Plotz Foundation for use during 1940-1941 must be in the hands of the executive committee before April. The maximum size of the grants will usually be less than \$500. According to the trustees of the fund, researches will be favored that are directed toward the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery. It was the original policy of the foundation to give preference to researches on a single problem or on closely allied problems, but during the present great need for funds grants will be given in the sciences closely related to medicine without reference to special fields. Grants may be used for the purchase of apparatus and supplies that are needed for special investigations and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus.

or materials which are ordinarily a part of laboratory equipment. Thirty-two grants were made during the past year. There are no formal application blanks, but letters asking for aid must state definitely the qualifications of the investigator, an accurate description of the research, the size of the grant requested and the specific use of the money to be expended. In their requests, applicants should state whether they have approached other foundations for financial assistance. It is highly desirable to include letters of recommendation from the directors of the departments in which the work is to be done. Applications should be sent to Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695 Huntington Avenue, Boston.

Society of Clinical Surgery.—The Society of Clinical Surgery will hold its sixty-eighth meeting in Nashville, Tenn., April 14-15, at Vanderbilt University Hospital. Among the presentations to be given in the amphitheater of the hospital are the following:

Dr. Daniel C. Elkin, Atlanta, Ga., Wound Healing.
Dr. John C. Burch, Nashville, Experimental Studies in Menstrual Disorders.
Dr. Hugh J. Morgan, Nashville, Results of Treatment of Pneumonia with Sulfapyridine.
Ann Minot, Ph.D., Nashville, Problems of the Administration of Fluids in Burns.
Dr. John B. Youmans, Nashville, Deficiency Diseases.
Dr. Rollin A. Daniel Jr., Nashville, Acute Abdominal Manifestations of Malaria.
Dr. Thomas E. Wyatt Jr., Nashville, Experiences in Thyroid Surgery in the Vanderbilt University Hospital.
Dr. Alfred Blalock, Nashville, Demonstration of Patients Treated for Constrictive Pericarditis.
Dr. Barney Brooks, Nashville, Resection of the Stomach for Benign Lesions.

Dr. Albert Szent-Györgyi, director of the Institute for Medical Chemistry and professor of medical chemistry, Royal Hungarian Franz Joseph University, Szeged, Hungary, who is this year's Flexner Lecturer at Vanderbilt, will speak Friday afternoon on "Biochemical Aspects of Vitamin Therapy." Dr. Samuel C. Harvey, New Haven, Conn., is president of the society.

Prizes for Scientific Research.—In answer to a request, the following list of prizes offered for medical research has been prepared from notices that have appeared in *THE JOURNAL*:

Foundation Prize, \$150, offered by the American Association of Obstetricians, Gynecologists and Abdominal Surgeons. Information from Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va.
Van Meter Prize, \$500 and two honorable mentions, offered by the American Association for the Study of Goiter. Information from Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pa.
Award for research in endocrinology, \$1,000. E. R. Squibb & Sons, to be awarded by the Association for the Study of Internal Secretions. Information from Dr. E. Kost Shelton, 921 Westwood Boulevard, Los Angeles.
Medal in ophthalmology, offered by the University of Buffalo. Information from Dr. Harold W. Cowper, 543 Franklin Street, Buffalo.
Francis Amory Prize, \$10,000, offered by the American Academy of Arts and Sciences. Information from the academy, 28 Newbury Street, Boston.
Pediatric awards, two of \$500 each offered by Mead Johnson & Co. through the American Academy of Pediatrics. Information from Dr. Borden S. Veeder, 3720 Washington Boulevard, St. Louis.
Prize in ophthalmology, \$100 offered by the Association for Research in Ophthalmology. Information from Dr. Cecil S. O'Brien, University Hospitals, Iowa City.
Prize for research on the vitamin B complex, \$1,000 given by Mead Johnson & Co. through the American Institute of Nutrition. Information from Leonard A. Maynard, Ph.D., Cornell University, Ithaca, N. Y.
Prize in thoracic surgery, \$250 offered by the Rose Lampert Graff Foundation of Los Angeles through the American Association for Thoracic Surgery. Information from Dr. Richard H. Meade Jr., 2116 Pine Street, Philadelphia.
Alvarenga Prize, awarded by the College of Physicians of Philadelphia. Information from Dr. J. Harold Austin, College of Physicians, 19 South Twenty-Second Street, Philadelphia.
Casselberry Prize, awarded for research in laryngology and rhinology. Information from Dr. James A. Babbitt, 1912 Spruce Street, Philadelphia.
Wellcome Prize, \$500, offered by the Association of Military Surgeons of the United States. Information from the secretary of the association, Army Medical Center, Washington, D. C.
Leon Bernard Prize, 2,500 French francs offered by the International Union Against Tuberculosis. Information from the National Tuberculosis Association, 50 West Fifth Street, New York.
Award for research on encephalitis lethargica, 1,000 Swiss francs, offered by the University of Berne, Switzerland. Information from the Dean of the Medical Faculty.
Umberto I Prize offered by the Rizzoli Orthopedic Institute of Bologna, Italy. Information from the president of the institute.

CORRECTIONS

"Kaba" Instead of "Karaba."—In Dr. Karl D. Figley's article on "Karaya Gum (Indian Gum) Hypersensitivity" in *THE JOURNAL*, March 2, page 747, in table 1, instead of "Karaba" made by the Battle Creek Sanitarium, the laxative should have been listed as "Kaba" distributed by the Battle Creek Food Company.

Cardiac Emergencies—Dosage of Aminophyllin.—In Dr. J. A. Lyon's article on cardiac emergencies in *THE JOURNAL*, March 9, page 837, column two, line two, the dosage of aminophyllin for intravenous administration is given as $\frac{1}{100}$ grain. The correct dosage for intravenous administration of aminophyllin is $7\frac{1}{2}$ grains (0.48 Gm.).

Subacute Yellow Atrophy of the Liver Due to "Solvent."—In the clinical note by Dr. Leo E. Braunstein, Schenectady, N. Y., in *THE JOURNAL*, January 13, the figure for the level of urea nitrogen in the middle of the first column on page 138 should have read 14 mg. instead of 114.

Government Services

Health of the Navy

Motor vehicle accidents were the leading cause of death in the U. S. Navy during the calendar year 1938, as they have been every year since 1930, except 1933, according to the annual report of the Bureau of Medicine and Surgery. There were fifty-four deaths from motor vehicle accidents and thirty-three from drowning, formerly the principal cause of death. There were 362 deaths from all causes, giving a rate of 2.6 per thousand. This rate is 31 per cent lower than the nine year median rate (3.78 per thousand).

There has been a general progressive decrease in the admission rate for the past ten years. In 1938 there were 54,810 new admissions from all causes, giving a rate of 393.7 per thousand as compared with a nine year median of 520.61. Wounds and injuries were responsible for 7,118 new admissions, a decrease of 4.76 per cent from 1937. The average number of sick days was 8.33 per person. There were 1,474 persons invalidated from the service. There were no disasters in 1938, but the report mentions the sinking of the submarine *Squalus* in May 1939, in which twenty-three enlisted men and one officer lost their lives.

On June 30, 1939, the medical corps of the navy numbered 841 medical officers, 255 dental officers, 132 chief pharmacists and pharmacists, 440 in the nurse corps and 4,375 in the hospital corps.

Expansion in the navy has increased the work of the bureau, and additional civilian employees are needed, the report said. The division of physical qualifications and medical records prepared 22,881 transcripts of medical records during the fiscal year, among other activities. This division is the repository for the medical department's journals, many of which need reconditioning, it was said.

During the fiscal year, a class of twenty-four medical officers completed the basic course at the Naval Medical School and twenty dental officers the course at the Naval Dental School. The medical personnel took a total of sixty-nine courses of instruction at various institutions.

Increasing emphasis is being placed on research, the report said. Plans are now being made to provide a research laboratory and to train additional personnel for continuous investigation of naval problems. The section of atmospheric hygiene has been especially concerned with the objective of supplying naval constructors with quantitative physiologic data relative to ventilation requirements for naval personnel.

The rescue and salvage work on the *Squalus* afforded a crucial test of laboratory knowledge and the results of experimental diving previously conducted by an experimental unit. More than 200 successful dives to a depth of 240 feet were made without injury to the divers.

With expansion of the naval air forces, there has been an increased demand for naval flight surgeons. Eight medical officers completed the basic course in aviation medicine during the fiscal year and five are assigned for the current year. In addition, training of selected medical reserve officers has been continued. It is the policy to recommend all reserve medical officers on duty at naval reserve aviation bases, or eye, ear, nose and throat specialists, for the correspondence course in aviation medicine. After this course is completed and after a period of practical instruction at an air station these officers are designated as qualified examiners.

Measures have been taken to extend research on the physiologic problems of naval aviation at the naval air station at Pensacola. A plan now being tried experimentally at Pensacola is radio communication between planes and ambulances for direction and guidance to the scene of a crash in outlying districts.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 17, 1940.

The Australian Expeditionary Force

The medical arrangements of the Australian Expeditionary Force, which has arrived at Suez, seem to be as complete as those of the home army. Before leaving Australia the whole force was roentgenographed for signs of tuberculosis and the blood group of every man was recorded in his pay book and inscribed on his identity disk, so that if severely wounded he could be transfused with minimum loss of time. Blood of the four groups will be available to surgeons of the Australian Army Medical Corps in mobile blood banks with refrigerators in which it can be stored and transported to advanced dressing stations. The medical corps believes that the expeditionary force will be the first of the allied armies to have the blood group of every soldier classified in advance. In the last war, when transfusions were required at advanced dressing stations the blood group had to be determined and search made among the walking wounded for a man of blood of the same group to act as a donor. Such men were seldom in first class physical condition after having lost blood themselves and spent long periods in the trenches. It is curious that just as the Australian system of blood grouping of every soldier has been published, an anonymous "layman" has written to the *British Medical Journal* advocating it. He has gone further and under the caption "Blood Grouping for All" recommended that civilians should also be grouped. He is certainly right, as the danger of civilian casualties on a large scale from air raids still exists.

Scheme for Evacuation of Children

The evacuation of children on a large scale from the cities in danger of attack by air has been described in previous letters. Though carried out by the government, this evacuation was entirely voluntary. As no attacks have occurred after more than five months of war many parents have brought their children back, though against the advice of the government, which remains convinced of the desirability of dispersal. Plans have therefore been prepared with the object of retaining in the reception areas as many as possible of the 400,000 children who are still there and of providing for a further large scale evacuation to take place if air raids develop on a scale involving serious and continuous bombing. These plans will apply to school children only—not to adults—and will be voluntary. But parents who register for evacuation will be required to sign an undertaking that they will send their children away when evacuation is ordered and that they will leave them in the reception areas until the school parties return. The provision of sick bays and hostels for difficult children and for those who are unsuitable for billeting in private houses will continue to be developed.

The Hands of Famous Surgeons

In the Museum of the Royal College of Surgeons is a case containing casts or drawings of the hands of famous surgeons. It seems natural that hands of the great operator should be finely formed with long sensitive and flexible fingers, but this is not always borne out by observation. In an article published in the *Lancet*, Mr. C. J. S. Thompson, curator of the historical collection of the museum, quotes Lanfranc, who brought Italian surgery to France in the thirteenth century. Himself a great operator, he said "A surgian must have handes wel-shaped, long small fingers & his body not quakyng & all must be of subtle wit." But close observation of the hands of many famous operators attending international congresses brought disillusionment to Mr. Thompson. Instead of sensitive

and tapering fingers with a finely formed palm, the majority did not correspond to his preconceived idea of what a surgeon's hand should be. Many of the hands were large and clumsy, with thick short fingers and spatulate tips.

Thompson discussed his view of surgeons' hands with Harvey Cushing, who said, with his whimsical smile, "I quite agree. From my observations I concluded that most of them were unspeakably awkward appendages." Cushing made a collection of casts of surgeons' hands, which is deposited in the museum of the Harvard Medical School. It includes the hands of W. W. Keen, W. J. Mayo, G. W. Crile, W. P. Graves, Putti and Bastianelli. The collection in the museum of the Royal College of Surgeons includes the hands of Syme, Lister, Mayo Robson, Moynihan and Harvey Cushing. The last presented the casts by request a short time before his death. It is interesting to compare his hands with those of Syme, another great operator. Cushing's hands are characteristic of the man. The fingers are small and short with broad tips but are well spaced. On the contrary, Syme's fingers are slender and tapering. His hand measures 9 inches in length, while Cushing's measures only 7½ inches.

Mustard Gas Injuries of the Eye

At the Section of Ophthalmology of the Royal Society of Medicine a discussion took place on gas injuries of the eye. Mr. M. H. Whiting stated that in the late war mustard gas was first used by the Germans in July 1917 and in that year over 52,000 gas casualties were produced. In 75 per cent there was little or no corneal involvement, in 15 per cent moderate involvement with slightly roughened cornea and in 10 per cent severe involvement with stained cornea. The first group was fit for duty in from one to four weeks, the second in from four to six weeks and many of the third group required long periods of treatment. The pathologic changes were denudation of corneal epithelium with flattening of the remaining cells.

Mr. R. E. Bickerton said that mustard gas caused pain and destruction of the corneal epithelium, laying bare Bowman's membrane, which rapidly softened and offered little protection to the lamellae of the cornea between which the gas in solution percolated. Keratitis ended in keratomalacia. These changes occurred in the lower third of the cornea, where the tears formed a liquid solution of the gas.

Mr. Lindsay Rea stated that the Germans suffered greatly from mustard gas in the war. In a translation of their official book obtained in 1918 they advocated the use of an alkaline ointment applied immediately. Now they recommend cod liver oil made alkaline with some dextrose added. Another treatment was the use of 800 parts of saturated magnesium sulfate and 200 parts of syrup of sugar, which had been used for many years in India and in the lock hospitals of London for acute blennorrhoea. But all treatment could only ameliorate the condition if it was neglected for the first twenty-four hours. At present no treatment was recommended which the patient could himself apply. He might be lying in a gas-saturated shell hole for hours. A small tube of hydrous wool fat ointment or boric acid ointment could be easily carried and left for the patient to apply until some skilled treatment was available.

The Influenza Epidemic

An epidemic of influenza of mild type is prevalent. The number of cases cannot be stated, as the disease is not notifiable. But the number of deaths ascribed to influenza in the large cities of England and Wales (which include over half of the total population) reported in the six weeks ended February 3 were successively forty-six, ninety-four, 158, 291, 416 and 350. These figures are higher than the normal for this time of year, but the age distribution of the deaths is of the normal type. Thus the greater numbers suggest greater prevalence rather than unusual severity.

PARIS

(From Our Regular Correspondent)

Feb. 4, 1940.

French Evacuation Centers

Confronted with a pitiless war waged alike against armed forces and civilian populations, the clear duty of the government was to evacuate many urban centers of their inhabitants. However, evacuation within the war zone, one of the most densely peopled sections of France, was no less necessary. Here more than 700,000 persons had to be removed. If one adds to these the numerous families, which for different reasons throughout the country have abandoned the towns for the country, and the 5,000,000 mobilized men and women, the grand total reaches at the lowest estimate 6,000,000 individuals of every age and of both sexes that had to be transported, fed, and medically and morally supervised within a short time. There is no parallel in history of a similar enterprise. The problems attending these enormous and rapid migrations had been anticipated in peace time, but while the purely military problems have received a satisfactory solution the needs of evacuated civilians are far from solved. In three months much has been done for the health service of these "refugees," of whom two thirds are women and children. Only twenty-three departments of the Southwest and West, generally agricultural, were available to harbor the evacuated millions, and, while the requisitions had all been made, no preparations had been instituted for the actual housing. However, the state department of health set up necessary health services, such as maternity and child welfare stations directed by Drs. Couvelaire and Lesne, antivenereal stations directed by Dr. Lévy Bing, cancer control stations under Dr. Roussy, and tuberculosis control stations under Dr. Besançon. Many of the sanatoriums had been requisitioned by the army and their inmates released. They had to be sought out and placed in other sanatoriums. In centers until then reserved for disease detection and prophylaxis, centers had to be organized for the handling of pneumothorax cases. Tuberculin tests for children were systematically carried out. The arrival of winter introduced a great privation, since children had to be bedded for weeks on straw mattresses and there was a shortage of bed covers.

The Faculty of the University of Strasbourg was installed at Périgueux, continuing its tasks and instruction and charged with the health supervision of the "refugees" from Alsace-Lorraine. There was a shortage of physicians, as the youngest and most active had been mobilized. The need was sought to be supplied in part by army physicians, without stinting the priority of claims of the soldiers. The "refugees" were also placed on the lists of free medical aid.

No epidemics and no abnormal morbidity or mortality have been observed either among the evacuated or in the civilian population. Of course, the conditions are not ideal. Nothing has been done, for example, for sports and leisure time activities or for the constructive occupations of the young people, who are idle and receive no vocational training. Winter has also increased the problems. Much needs still to be done.

The Art of Healing

Aubertin, on assuming the chair of therapeutics at the Faculty of Medicine of Paris early in January, delivered the opening lecture in accordance with tradition. This requires, among other things, an exposition of the views of the incumbent in relation to his professional functions. Aubertin pointed out the intimate connections between the healing art and the clinic. The causes of error that occasionally developed skepticism arose principally from individual cases. However, the objective controls of chemistry, histology, bacteriology and especially the graphic aids throw light on the mechanism of therapeutics and pharmaco-

dynamics. Aubertin conceived the teacher of therapeutics as a man of a youthful, curious, open, forward looking mind, continuously testing new drugs and stressing the actual achievements of medical science against the discouragements that skeptical moods might inspire.

AUSTRALIA

(From Our Regular Correspondent)

Feb. 13, 1940.

Social Medicine in New Zealand

The dominion of New Zealand, with just over one million people, is giving the world an interesting experiment in "socialized" or state controlled medicine. The state, through its department of health, controls almost every function demanded of a public health service. In addition to matters of environmental sanitation (water and food supplies, housing, nuisance abatement, methods of disposal of refuse and sewage) the department is concerned with the investigation and control of infectious diseases, with maternity and child welfare service, with school medical and dental services and with hospital services public and private. It is also associated with the work of boards controlling the medical and dental professions, and it takes an even more active part in the work of boards responsible for the training, registration and control of nurses, midwives, maternity nurses, masseurs and opticians; and it is interested in medical research.

The most noteworthy feature of the system concerns the administration of the social security act of 1938. This makes provision for medical and hospital treatment and for "such other benefits as may be necessary to maintain and promote the health and general welfare of the community." The principal classes of benefits provided comprise medical, pharmaceutical, hospital and maternity benefits. Supplementary benefits contemplated include specialist and consultant services, radiologic and laboratory services, home nursing and domestic assistance, and dental services. Hospital and maternity benefits are now in operation. Benefits are available to all persons ordinarily resident in New Zealand without regard to race, nationality or economic status, the main object of this legislation being to ensure that in the treatment of the sick the economic circumstances of the individual patient will cease to be a consideration either from the point of view of the patients or from the point of view of those actually rendering service.

A special division of the department undertakes the dental treatment of school children. It is staffed by dental surgeons who are responsible for the administrative and instructional side and by dental nurses specially trained by the department, who undertake the actual treatment. The work is concentrated on children whose ages are from 5 to 8 years. The attendance of children under school age, however, is encouraged. Three hundred and twenty-four clinics have been established. Each clinic deals with children of certain schools in the vicinity, and these are organized into a "dental group" the local administration of which is in the hands of a dental clinic committee composed of local residents. Besides undertaking various duties in connection with local administration, these committees have to undertake the task of raising funds to meet a certain proportion of the cost of operating the clinics. Treatment of the children in the clinics is carried out by the school dental nurses. There are some 1,600 schools linked up with this service and 94,000 children are now under dental supervision.

Camps for undernourished children are established throughout the dominion. A national health camp federation has been formed to deal with the extension of existing camps. Any one can nominate a child for admission to a camp but the child must be seen and recommended by a medical practitioner before he is admitted. Funds to finance these camps are raised by local charities, national art unions and from Christmas health stamps,

which are annually on sale at all post offices from the beginning of October at a surcharge of a penny on ordinary postage rates. These camps have amply demonstrated the good which can be done to children by a simple regimen permitting adequate rest, fresh air, sunshine and proper feeding.

The object of the milk in schools scheme is to make available to all school children in the dominion a half pint of pasteurized bottled milk on each school day. The milk is provided free of cost to the children, and the acceptance of the milk by the child is entirely voluntary. Two alternative schemes, the supply of malted milk powder or the supply of milk for cocoa-making purposes, are offered to schools when it is found impracticable to extend the pasteurized bottled milk supply owing to areas of isolation and scattered school population presenting insuperable difficulties. The scheme has progressed to a point where milk is now available to some 220,000 children. Medical and educational authorities testify to the good effect on the children of the scheme.

New Zealand is in an unenviable position as regards the incidence of hydatid disease. For years an intensive educational campaign has been waged against it. In 1938 a step forward was taken by passing legislation making it compulsory for all dog owners to purchase from the local authorities an approved remedy for tapeworm in dogs at the time of registration. Printed instructions regarding the administration of the remedy and advice as to the methods of preventing hydatid disease are issued with the remedy. During 1938 some 375,000 vials, each containing four tablets of one-fourth grain (0.016 Gm.) of arecoline hydrobromide were supplied to local authorities for distribution to dog owners.

BELGIUM

(From Our Regular Correspondent)

Feb. 2, 1940.

Specialists in Hygiene

By a royal decree the instruction qualifying for the practice of hygiene has been reorganized. Prerequisite to admission to the examinations is a doctor's degree in medicine, surgery and obstetrics and at least a year of intensive training subsequent to the medical training. The examination covers four fields:

Group A. Public Hygiene. This includes (1) the hygiene of dwelling places, towns and the relation of the atmosphere and sunshine to hygiene, (2) the composition, changes and adulterations of foods including drinking water and residuary waters, (3) prophylaxis against communicable diseases including the bacteriologic analysis of beverages and foods, (4) school hygiene including the elements of biology and physical education, (5) general statistics, (6) legislation and organization pertaining to sanitation, (7) toxicology and (8) tropical medicine.

Group B. Social Hygiene. This group includes (1) social medicine including knowledge of health legislation, (2) infant hygiene, (3) occupational hygiene under the law, (4) hygiene of foods, (5) school hygiene, (6) general statistics, (7) mental hygiene, (8) the prophylaxis of communicable diseases, (9) the physiology of work, biometry and occupational orientation, and (10) prevention of other social evils (pauperism, prostitution, vagabondage). The instruction offered in this group must be completed by practical stages in a medicosocial institution.

Group C. Occupational Hygiene. This includes (1) the physiology of work, biometry, occupational orientation, (2) industrial technology, (3) legal aspects of work accidents and occupational diseases and the determination and evaluation of invalidism, (4) industrial and occupational hygiene and legislation, (5) toxicology, (6) hygiene of the atmosphere, sunshine, dwelling places and towns, (7) prophylaxis against communicable diseases, (8) protection of workers under the law, (9) medical statistics of workers and (10) general statistics.

Group D. School Hygiene and Physical Education. Under this head are included (1) the theory of physical education, (2) the analysis of motions, (3) the biology of physical education, (4) infant adolescent and adult biometry, (5) knowledge of the biology of physical education, and (6) school hygiene (advanced) covering supplementary knowledge of the diseases of school children, knowledge of experimental psychology, elements of methodology, legislation and general statistics.

Treatment of Gonorrhea at Public Expense

In fear of a recrudescence of venereal diseases, new regulations have been formulated for the maintenance of public health. No such effective control existed in the past for gonorrhea as was available for syphilis. The government had not been remiss in its fight against gonorrhea but the absence of a specific remedy and the deceptive results obtained led to the abandonment of public measures. Since then, sulfanilamide has led to a revival of governmental control. It has been decided to accept indigent gonorrheal patients for treatment at the expense of the state in clinics, polyclinics and dispensaries approved by the state. The institutions approved obligate themselves (1) to make no charge whatever and to assure the fullest secrecy to indigent men and women, (2) to keep a medicosocial file, (3) to conduct consultations with dignity (questions asked and physical examinations made may not take place in the presence of a third person), (4) to accept the supervision of the state department of health, (5) to submit statistical reports every three months and prepare an annual report, and (6) to procure their medicaments from accredited druggists. The department of public health will participate in the expense incurred by institutions on the approved list.

Occupational Diseases of Engravers

Uytendhoeft discussed, before the Belgian association of social medicine, the work conditions of 270 workers and the occupational diseases to which they are exposed in engraving, photogravure, lithography and other branches of printing. The diseases observed, he said, spring principally from three causes: the effect of radiation proceeding from electric arcs, the formation of acid vapors and the effect on the skin of numerous chemical bodies, among which turpentine, alkaline chromates and chromic acids were the most numerous. The disorders noted were found especially in the eyes as a result of radiation and acid vapors and on the skin in the form of dermatitides, eczema, ulcerations and so on. The taking of necessary precautions and the education of the workers seem to be the only effective remedies.

Marriages

IRVING E. SHAFER, Salisbury, N. C., to Miss Maggie Jane Honeycutt of Franklinton, in New York, January 16

RICHARD T. STEPHENSON, New Orleans, to Miss Harriet Shirley Knowles of Jackson, Miss., February 4.

ARTHUR DINTENFASS, Philadelphia, to Miss Theresa Kurtz Kline of Atlantic City, N. J., Sept. 12, 1939.

ARTHUR PAUL McDONALD to Miss Eleanor Marie Schneider, both of Dayton, Ohio, in January.

MARRES HAROLD WIRIG, Madison, Wis., to Miss Eleanor Narloch of Antigo, January 13.

BERNARD ROBERT SHARFF to Miss Jean Frances Conc, both of Portland, Ore., Dec. 30, 1939.

PAUL P. GOODMAN to Miss Margaret Helen Lewis, both of Milwaukee, January 13.

ORA R. McMURRY to Mrs. Marie Isbell, both of Eagle River, Wis., January 8.

ABE GOLDEN to Miss Babette Colm, both of New Orleans, January 31.

GEORGE SHUCKER to Miss Rose Medvene, both of Philadelphia, January 14.

Deaths

Walter Appleton Lane ☉ Milton, Mass.; Harvard Medical School, Boston, 1899; member of the New England Pediatric Society; member of the House of Delegates of the American Medical Association in 1937; at one time assistant in chemistry at his alma mater; past president of the Norfolk District Medical Society; formerly vice president of the Massachusetts Medical Society; served during the World War; at one time school physician; on the staffs of the New England Deaconess Hospital and the Faulkner Hospital, Boston, the Sharon (Mass.) Hospital and the Milton Hospital and Convalescent Home; aged 66; died, January 21.

Albert William Moore ☉ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1904; University of Pennsylvania Department of Medicine, Philadelphia, 1905; fellow of the American College of Surgeons; served during the World War; at one time medical director of the city public schools and member of the board of health; formerly medical director of the Hamilton National Life Insurance Company; on the staff of the Good Samaritan Hospital; aged 63; died, January 20.

Matthew Beardwood ☉ Philadelphia; Medico-Chirurgical College of Philadelphia, 1894; instructor of chemistry from 1896 to 1899, lecturer of clinical chemistry, 1899-1900, adjunct professor from 1900 to 1914 and professor of general chemistry and toxicology at his alma mater from 1914 to 1916; professor of chemistry at the Ursinus College, Collegeville; author of "Students' Notes on Toxicology," published in 1904; aged 68; died, January 28, in the Presbyterian Hospital of coronary thrombosis.

Melville Day Dickinson, Rockville Centre, N. Y.; Albany Medical College, 1890; fellow of the American College of Surgeons; for many years district state health officer with jurisdiction over Nassau and Suffolk counties; served the city of Troy for four years as school medical inspector, eight years as deputy health officer and five years as health officer; at one time president of the medical and surgical board of the Troy Hospital; aged 71; died, January 30, of coronary occlusion.

Charles John McCambridge, Poughkeepsie, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1898; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; associate surgeon to the Samuel W. Bowne Memorial Hospital and St. Francis Hospital; consulting surgeon to the Hudson River State Hospital; aged 64; died, January 8, of streptococcal pneumonia and cerebral hemorrhage.

James Henry Payne ☉ Acting Assistant Surgeon Lieutenant (j. g.), U. S. Navy, Boston; Harvard Medical School, Boston, 1889; entered the Navy in 1911; served in the Spanish-American War, the Boxer Rebellion in China, the Philippine Insurrection and the World War; retired Sept. 1, 1935, on attaining age of 70 years; aged 76; died, January 31, in the United States Naval Hospital, Chelsea, of bronchopneumonia and arteriosclerotic heart disease.

Louis Rudolph Padberg ☉ St. Louis; Beaumont Hospital Medical College, St. Louis, 1900; St. Louis University School of Medicine, 1910; coroner; senior instructor in pediatrics, St. Louis University School of Medicine; served on the staff of the Alexian Brothers' Hospital in various capacities; aged 61; on the staff of St. Anthony's Hospital, where he died, January 22, of a ruptured left ventricle.

Wilson P. Long, Weatherly, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1886; member of the Medical Society of the State of Pennsylvania; at one time county coroner and member and president of the board of health; for many years physician for the schools of Weatherly; aged 78; died, January 8, in the Hazleton (Pa.) State Hospital.

Charles Francis Linn ☉ Monongahela, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served during the World War; formerly president of the board of health; past president of the Washington County Medical Society; aged 65; on the staff of the Memorial Hospital, where he died, January 16, of pulmonary tuberculosis.

Oscar Williams McEntire, Howard, Pa.; Howard University College of Medicine, Washington, D. C., 1885; Jefferson Medical College of Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; past president of the Centre County Medical Society; aged 82; died, January 26, of myocarditis and arteriosclerosis.

John Hibbard Pettis ☉ Fresno, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; fellow of the American College of Surgeons; past president of the Fresno County Medical Society; on the staff of the Fresno County General Hospital and the Burnett Sanitarium; aged 62; died, January 28.

Dever James Peck, Susquehanna, Pa.; University of the City of New York Medical Department, 1886; member of the Medical Society of the State of Pennsylvania; past president of the Susquehanna County Medical Society; aged 83; died, January 26, in the Robert Packer Hospital, Sayre, of pneumonia.

Thomas Catlett Gibson ☉ Washington, D. C.; Georgetown University School of Medicine, Washington, 1893; member and past president of the Utah State Medical Association; formerly on the staff of St. Mark's Hospital, Salt Lake City; aged 74; died, January 29, of cerebral hemorrhage and hypertension.

James Pearce Hillard, Springfield, Mass.; Jefferson Medical College of Philadelphia, 1903; member of the Massachusetts Medical Society; for many years medical inspector in the public schools of Springfield; formerly served as physician for the police and fire departments; aged 62; died, January 29.

James Carpinter Cobey ☉ Frostburg, Md.; College of Physicians and Surgeons, Baltimore, 1896; served during the World War; past president of the Allegany-Garrett Counties Medical Society; on the staff of the Miners Hospital; aged 65; died, January 29, in Los Angeles of coronary thrombosis.

William George Falconer ☉ Clearfield, Pa.; Jefferson Medical College of Philadelphia, 1919; fellow of the American College of Physicians; past president of the Clearfield County Medical Society; aged 51; on the staff of the Clearfield Hospital, where he died, January 3, of coronary occlusion.

John Gunkle Thomas, Broomall, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1869; member of the Medical Society of the State of Pennsylvania; Civil War veteran; for many years member of the Newtown Square township school board; aged 95; died, Dec. 13, 1939.

Joshua Lawson Herrington, Mullin, Texas; University of Tennessee Medical Department, Nashville, 1891; member of the State Medical Association of Texas; for many years member of the board of education; health officer; aged 78; died, Dec. 12, 1939, of carcinoma of the pancreas.

David Damon Pratt ☉ New Bedford, Mass.; Harvard Medical School, Boston, 1906; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital; aged 59; died, January 29, of coronary occlusion.

Joseph Erle Jack ☉ Salt Lake City; Columbia University College of Physicians and Surgeons, New York, 1920; fellow of the American College of Surgeons; surgeon to the Dr. W. H. Groves Latter Day Saints Hospital; aged 46; died, January 30, of coronary occlusion.

John Huey Humes, McKees Rocks, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1902; served during the World War; on the staff of the Ohio Valley General Hospital; aged 60; died, January 28, in the Shadyside Hospital, Pittsburgh.

Charles Ashton Love Sr., San Bernardino, Calif.; American Medical College, St. Louis, 1890; aged 79; died, January 28, in a local hospital, of injuries received when the automobile in which he was driving was struck by a street car.

Douglas Martin Fuchs, East Pepperell, Mass.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1922; member of the New England Society of Psychiatry; aged 42; was found dead, January 10.

Robert Francis Kile, San Francisco; University of Pennsylvania School of Medicine, Philadelphia, 1919; member of the California Medical Association; aged 51; died, January 31, of coronary occlusion and cerebral thrombosis.

Arthur D. Lafrance, New Bedford, Mass.; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, Que., Canada, 1913; aged 54; died, January 5, of acute dilatation of the heart.

Benjamin E. Jones, Rock Island, Ill.; Louisville (Ky.) Medical College, 1884; for many years medical director of the Modern Woodmen of America; aged 79; died, January 17, in Davenport, Iowa, of gastrointestinal hemorrhage.

Barton Jerome Powell Sr., ☉ Stockton, Calif.; Jefferson Medical College of Philadelphia, 1894; fellow of the American College of Surgeons; aged 66; on the staff of St. Joseph's Hospital, where he died, January 16, of pneumonia.

Thomas Spees Carrington, Los Angeles; Gross Medical College, Denver, 1891; at one time a missionary; served during the World War; aged 71; died, January 21, in the Veterans Administration Facility, West Los Angeles.

Wellington Manley Ross • Buffalo; University of Buffalo School of Medicine, 1911; on the staffs of the La Fayette General Hospital and St. Mary's Hospital; aged 62; died, January 11, of cardiovascular disease.

Dennis P. Harris, Beaumont, Texas (licensed in Texas, under the Act of 1907); member of the State Medical Association of Texas; aged 61; died, Dec. 18, 1939, in St. Therese Hospital of cardiorenal disease.

George Henry Richardson, San Francisco; University of Pennsylvania Department of Medicine, Philadelphia, 1891; aged 73; died, Dec. 1, 1939, in the Veterans Administration Facility of cerebral hemorrhage.

Anselme Ephrem Houle, Cohoes, N. Y.; Albany Medical College, 1893; served during the World War; aged 67; died, January 21, in the Troy (N. Y.) Hospital of chronic myocarditis and arteriosclerosis.

Albert Erving Kilgore, Brooks, Maine; University of Vermont College of Medicine, Burlington, 1886; member of the Maine Medical Association; aged 76; died, January 7, of coronary thrombosis.

David I. Giarth, Kittanning, Pa.; Jefferson Medical College of Philadelphia, 1889; member of the Medical Society of the State of Pennsylvania; aged 80; died, January 20, in Ford City of myocarditis.

William W. Minick, Wichita, Kan.; Homeopathic Medical College of Missouri, St. Louis, 1891; formerly mayor; veteran of the Spanish-American War; died, January 21, in Santa Monica, Calif.

Wayland Mitchell, Lewiston, N. C.; University of Maryland School of Medicine, Baltimore, 1895; formerly member of the state legislature; aged 68; was found dead, January 1, of myocarditis.

Harry Royal Nye • Leominster, Mass.; University of Vermont College of Medicine, Burlington, 1900; on the staff of the Leominster Hospital; aged 67; died, January 8, of accidental gas poisoning.

George O'Bryant De Bar, Eugene, Ore.; Missouri Medical College, St. Louis, 1874; member of the Oregon State Medical Society; aged 90; died, January 27, of myocarditis and arteriosclerosis.

James Andrew Sylvester Pinson, Philadelphia; Meharry Medical College, Nashville, Tenn., 1916; Temple University School of Medicine, Philadelphia, 1917; aged 49; died in January.

George A. Kohler, Minneapolis; Minneapolis College of Physicians and Surgeons, 1900; aged 76; died, January 9, of arteriosclerosis, hypertension, hemiplegia and coronary thrombosis.

John David Verner, Walthalla, S. C.; Emory University School of Medicine, Atlanta, 1915; served during the World War; aged 48; died, January 22, of acute dilatation of the heart.

William Everett Reynolds, Hopkinsville, Ky.; Vanderbilt University School of Medicine, Nashville, 1877; Confederate veteran; aged 95; died, January 26, of cerebral hemorrhage.

George M. Straight, Winchester, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; for many years county physician; aged 82; died, January 28, of coronary thrombosis.

William Harold Davis, Arlington, Texas; College of Physicians and Surgeons, Baltimore, 1881; aged 81; died, January 24, of cerebral hemorrhage and chronic myocarditis.

William Charles White, Live Oak, Fla.; University of the South Medical Department, Sevanee, Tenn., 1903; postmaster; aged 62; died, January 15, of a self-inflicted gunshot wound.

Frederick Clayton Brigham, Springfield, Mass.; Baltimore Medical College, 1898; aged 68; died, January 22, in the Westfield (Mass.) State Sanatorium of pulmonary tuberculosis.

John Lewis Hanes, Pine Hall, N. C.; University of Maryland School of Medicine, Baltimore, 1902; aged 60; died, January 15, in a hospital at Winston-Salem of lobar pneumonia.

George Palmer Thomas, Rochester, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; aged 64; died, January 30, of carcinoma of the rectum.

Franklin S. Davis • Peoria, Ill.; Chicago Homeopathic Medical College, 1893; aged 70; on the staff of the Methodist Hospital, where he died, January 27, of pneumonia.

Sophus Nicolai Jorgensen • San Francisco; Hahnemann Hospital College of San Francisco, 1897; aged 71; died, Dec. 26, 1939, of hemorrhage and duodenal ulcer.

Samuel Lewis Holley, Kittanning, Pa.; Miami Medical College, Cincinnati, 1878; aged 91; died, January 29, in the Armstrong County Hospital of pneumonia.

David Lipscomb Watson • New Orleans; Medical College of Alabama, Mobile, 1891; aged 71; died, Dec. 18, 1939, of arteriosclerosis and coronary occlusion.

Charles Henry Grube, New York; University of the City of New York Medical Department, 1879; aged 81; died, January 21, of cirrhosis of the liver.

Mary Hoffman Jones, Council Bluffs, Iowa; Hahnemann Medical College and Hospital, Chicago, 1896; aged 79; died, January 9, of coronary thrombosis.

John J. Seale, Dallas, Texas; Baylor University College of Medicine, Dallas, 1908; aged 64; died, January 30, of lobar pneumonia and cerebral hemorrhage.

Morris Aaron Weinger • Lynn, Mass.; Boston University School of Medicine, 1927; aged 40; died, January 27, at Miami Beach, Fla., of coronary thrombosis.

Joseph F. McKaig, Washington, D. C.; Georgetown University School of Medicine, Washington, 1893; aged 70; died, January 21, of coronary occlusion.

William Littleton Robins, Washington, D. C.; University of Maryland School of Medicine, Baltimore, 1890; aged 70; died, January 28, of coronary occlusion.

William Henry Killeavy Crehan, Stratford, Ont., Canada; University of Toronto Faculty of Medicine, 1921; aged 49; died, January 11, of heart disease.

Conrado Garza Cantu, Laredo, Texas; Escuela de Medicina de Nuevo Leon, Monterrey, Mexico, 1884; aged 84; died, Dec. 5, 1939, of edema of the lungs.

Willis Benton Stewart, Indianapolis; Hahnemann Medical College and Hospital, Chicago, 1888; aged 84; died, January 7, of chronic myocarditis.

Arthur Richard Carter, New Orleans; Memphis (Tenn.) Hospital Medical College, 1905; aged 61; died, Dec. 23, 1939, of chronic myocarditis.

Erminnie Hill Smallwood, McArthur, Ohio; Woman's Medical College of Cincinnati, 1894; aged 75; died in January of heart disease.

Joseph M. Byler, Warsaw, Ind.; Hahnemann Medical College and Hospital, Chicago, 1876; aged 92; died, January 24, of arteriosclerosis.

William Francis Babb, London, Ont., Canada; Western University Faculty of Medicine, London, 1903; aged 68; died, Dec. 1, 1939.

Alex E. Brosier, Amistad, N. M.; Medical College of Ohio, Cincinnati, 1896; aged 79; died, January 22, of bronchopneumonia.

De Lacy Faust, Liberty, N. C.; Davidson School of Medicine, Davidson, 1905; aged 57; died, January 1, of coronary thrombosis.

Moses De Ford • Philadelphia; Jefferson Medical College of Philadelphia, 1886; aged 76; died, January 28, of coronary thrombosis.

Edmond Raoul Berges, Geyserville, Calif.; College of Physicians and Surgeons of San Francisco, 1897; aged 63; died in January.

Julius Emmanuel Fohrenbach, Philadelphia; Jefferson Medical College of Philadelphia, 1894; aged 66; died, Dec. 13, 1939.

Morgan P. Bates, Ramburst, Ga.; Chattanooga (Tenn.) Medical College, 1894; aged 77; died, January 30, of pneumonia.

Jasper Beattie, Lincoln, Neb.; Barnes Medical College, St. Louis, 1894; aged 72; died, January 30, of aortic insufficiency.

John Granville Osborne, Houston, Texas; Leonard Medical School, Raleigh, N. C., 1910; aged 67; died, January 23.

Francis Arthur Murray, Lake City, Fla.; Leonard Medical School, Raleigh, N. C., 1908; aged 57; died, January 11.

John Daniel Cooper, Brookeland, Texas; Gate City Medical College, Dallas, 1907; aged 78; died, Dec. 10, 1939.

Brooks B. Glover, Kedron, Ark. (licensed in Arkansas in 1903); aged 83; died, January 3, of chronic nephritis.

Nathan Winter • New York; Long Island College Hospital, Brooklyn, 1918; aged 52; died, Dec. 30, 1939.

Albert Edward Adkins, Norborne, Mo.; Missouri Medical College, St. Louis, 1887; aged 89; died in January.

Bureau of Investigation

ANOTHER BALD FRAUD

"Linday's New Hair Compound" Declared a Fake

Of the making of many "hair growers" there is no end! One, "Linday's New Hair Compound," has run afoul of the Post Office Department at Washington and been debarred from the mails. The fraud order was made to cover the firm names "Linday" and "Linday Laboratory," New York.

On Nov. 22, 1935, the Federal Trade Commission announced that it had ordered this company to cease and desist from making false and misleading representations for its product as a "hair restorer."

In the Post Office case the principal in the enterprise, Murray L. Linday, was called on to show cause why a fraud order should not be issued against his business. Linday replied with a letter denying the charges and also submitted nine testimonial letters he claimed to have received. Neither he nor any one representing him, however, put in an appearance on the date set for the hearing.

The memorandum on the case, prepared by Post Office Solicitor Vincent M. Miles, brought out that Linday was engaged in advertising and selling through the mails Linday's New Hair Compound as a treatment for growing hair on persons already bald as well as those inclined toward baldness. The business was started in 1927 and operated up to 1935, when it was suspended, resuming operation in the spring of 1938.

Those who answered the advertisements, one of which offered a free booklet containing the advice of "an outstanding authority" on "a harmless way to remove dandruff or itch, stop and prevent excessive hair loss," received a four page form letter reading in part:

The information and advice provided in this brief outline, is supplied by a mind that has devoted a lifetime to the study of the various causes of hair and scalp ailment, and to years of research for such means as might provide the most effective form of correction and adjustment.

It is necessary for man to resort to artificial means, yet to make that means as near to being natural as possible to replenish and regenerate if possible the lack of potency both in quality and quantity of the fatty substance in the scalp, if he is to make his hair strong against disease or baldness, or if he hopes to grow it back. And it is with this definite thought in mind that all research was directed. The result of which is the formation of a compound containing 8 different highly potent oils and natural animal fat, that are intended to supply wherever and whenever possible through external means, the function of increasing both in quality and quantity, the natural fatty content of the scalp. These fats and oils supply a natural constructive action, and offer the means for greater resistance against external disintegration and infection.

Prior to April 1937, we provided almost 40 different formulae to suit the individual requirement. But as our records over a period of years showed that all cases regardless of sex or age responded most favorably to formula 8B, we made the practice of supplying this formula to all cases regardless of detail, and we find that this has been most effective and successful.

The 8B formula will stop excessive hair loss almost at once, because it removes the harmful factors in the scalp that tend to weaken the hair, and because it supplies such matter as tends to strengthen through natural means. It will help restore the natural color and brilliance of the hair because of the constructive potent value of the natural oils and fats in the compound. It will make hair soft in texture, and in every respect provide the maximum satisfaction available from external means. In cases of Alopecia Areata (bald patches), it has never failed to regrow the hair within 60 days.

The memorandum went on to show that persons who swallowed the bait and sent in their money received a jar of semiliquid substance. Government chemists who analyzed this reported that it was essentially a mixture of lard, castor oil, cottonseed oil, cod liver oil, witch hazel, bay rum, saltpeter, beta-naphtha, kerosene and bergamot oil.

Medical evidence presented for the government's case showed that the preparation, because of the fixed oils or greases it contained, would tend temporarily to soften the hair and also the external layers of the scalp, have some slight stimulating or irritant effect on it, temporarily check excessive dandruff and to some slight extent inhibit the growth of certain germs. The evidence showed, however, that there is no known drug or combination of drugs which will correct all causes of loss of hair; that the product in question when applied as directed would not reach the so-called hair root or papilla; and that the promoter's representation that the mixture would "bring in a real regrowth of hair" on bald-headed persons was false and fraudulent.

It was also brought out in this case that Mr. Linday is a concert violinist but was without work in that profession for some time, and that he is not a physician, pharmacist or chemist, nor does he employ any such persons in the conduct of his business. A bit of humor is introduced in the memorandum: "When Mr. Linday was interviewed by a Post Office inspector some months ago, it was noted that the top of his head was sparsely covered by hair!"

As the defendant did not offer acceptable evidence to show why a fraud order should not be brought against him, such an order was issued on June 16, 1939. Thus Linday's "cure" goes

HAIR TROUBLE?

Read what a renowned scientist has discovered after 30 years of intensive research. Learn from him the **CORRECT** and harmless way to remove dandruff, how to make dry or brittle hair soft and lustrous, how to check an over-ovely scalp condition and how to stop an itching scalp. Let him give his answer to the secret sought by mankind for centuries. "How to cover **BALD SPOTS** or how to **REGROW** lost hair." All this and more that is told in a booklet called **A PROFESSOR'S ADVICE** will save you time, money and headache, and is sent **ABSOLUTELY FREE** upon request by, **LINDAY, 361 WEST 29th ST., N. Y. C.**

Name (Print).....

Address.....

A typical Linday advertisement.

into partial if not total eclipse. His actual or prospective customers need not despair; there'll be another one along any time now, just as good—and just as worthless!

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bowman's Cramp and Diarrhea Mixture.—Bowman Bros. Drug Co., Canton, Ohio. Composition: Chiefly alcohol, water, chloroform, menthol and a morphine-bearing drug. Fraudulently represented as a remedy for cramps, diarrhea, bloody flux and so on.—[N. J. 30241; June 1939.]

Bromo Sed and Somno Sed.—Roche, Renaud Pharmaceutical Co., Inc., Fairhaven, Mass. Composition: Less than the 80 grains of strontium bromide and 2 grains of phenobarbital per ounce that the product was falsely labeled to contain.—[N. J. 30244; June 1939.]

Edwenil.—Spicer & Co., Glendale, Calif. Composition: Essentially magnesium and nitrogenous compounds in a solution of common salt, with small amounts of carbolic acid and silica. Fraudulently represented as effective for respiratory disorders, especially pneumonia, and for carbuncles, skin infections and some other disorders.—[N. J. 30231, 30232; June 1939.]

Elmi Electro Mineralized Water.—Electro Mineral Co., Detroit. Composition: An artificially prepared mineral water containing approximately 0.7 per cent of Glauber's salt, a small quantity of alkali and negligible amounts of other mineral substances. Did not possess peculiar electrical properties. Fraudulently represented as a remedy for rheumatism, indigestion, boils, decaying teeth, skin eruptions, diabetes and some other disorders.—[N. J. 30236; June 1939.]

Hytest Cold Capsules.—International Drug Sales Co., Denver. Composition: Not reported, except that no acetanilid was present, though label claimed 1½ grains of it per capsule. Declared adulterated.—[N. J. 30240; June 1939.]

Sexol Tablets.—Eric Laboratories, Cleveland. Composition: Essentially iron phosphate, talc, plant extracts and an alkaloid. Fraudulently represented as an invigorating tonic and as a stimulant.—[N. J. 30229; June 1939.]

Correspondence

MUCOR INFECTION

To the Editor:—Referring to the Wade-Matthews article "Cutaneous Mucor Infection of the Face" (*THE JOURNAL*, February 3, p. 410), Kovnat and I reported in *THE JOURNAL* Dec. 10, 1932, under the title "Streptotrichosis" one case which, besides presenting all the important characteristics of the acute pulmonary form of the disease, "is the only case, so far as a search of the literature can reveal, that is directly traceable to a chronic skin nodule of the same etiology existing dormant for many years" (Brown, Lawrason: *Yearbook of General Medicine*, 1933).

The acute and chronic cutaneous forms of this disease are well known and amply described by Edith J. Claypole (*Human Streptotrichosis and Its Differentiation from Tuberculosis*, *Arch. Int. Med.* 14:104 [July] 1914), Flexner (*Pseudotuberculosis*, *J. Exper. Med.*, 1899) Stein (*Fadenpilzkrankungen*, Lehmanns Atlanten, 1931) and others.

The disease in itself is rather a common one but seldom recognized. The diagnostic difficulty consists in the extreme pleomorphism of the causative organism. Conditions caused by the same fungi bearing this very high scale of botanic variation are called sporotrichosis, streptotrichosis, nocardiosis, pseudo-actinomycosis, "mucor infection," and other names. We recommended that the name streptotrichosis be retained until classification is standardized.

The diagnosis is always easy. The Mezei granules are invariably present in each such skin condition and are pathognomonic for this disease. These granules can be easily detected. A plain smear of the suspected material will show by transmitted light spherical, brownish granules in diameters from 0.01 to 2 mm. This is typical. These granules disappear in stained specimens.

As to the treatment, a deep cauterization of the affected skin is advisable, followed by autovaccine.

CORNELIUS M. MEZEY, M.D., New York.

CHEMICAL TESTS FOR ALCOHOLIC INTOXICATION

To the Editor:—It is implied in the editorial comment (*THE JOURNAL*, February 3, page 415) on the 1939 report of the Committee on Tests for Intoxication of the National Safety Council, Chicago, that there is no question regarding the validity of chemical tests for alcoholic intoxication. While it is desirable to have clarity with respect to legal definitions of such phrases as "under the influence" and "intoxicated," it is also necessary to have confidence in the reliability of chemical tests involving concentrations as small as 0.05 per cent by weight of alcohol in the blood, urine, saliva or breath, if such tests are to be sanctioned legally.

Biochemists and toxicologists who have had extensive experience with these tests are not convinced that they are as reliable as might be implied by the recommendation of the American Medical Association Committee to Study Problems of Motor Vehicle Accidents. Based on the Nicloux method of estimating organic reductants by dichromate color changes, tests for alcohol are relatively nonspecific. While titration may increase the accuracy, it has no bearing on specificity. The toxicologist to the coroner of San Francisco became skeptical of positive tests for alcohol in blood at a necropsy when it was extremely unlikely that the individual had taken alcohol prior to death. This skepticism led to many laboratory experiments on animals. These experiments are still in progress but have definitely served to cast doubt on the reliability of the Heise-Halpern test, which

is commonly employed. Triplicate analyses, including distillation, of the same blood sample usually agree closely. But examinations of blood obtained from normal healthy rats, that have never ingested alcohol, as far as is known, reveal an appreciable number of animals in which there is an apparent alcohol concentration sometimes as high as 0.15 per cent. The incidence of positive tests for alcohol in the blood by the standard colorimetric method seems to be higher in rats exposed to asphyxiation.

The most likely explanation of these observations is that there are interfering compounds which may be distilled from body fluids and which may yield positive color reactions with dichromate-sulfuric acid mixtures. Our evidence suggests lactic and pyruvic acids, even though their boiling points are much higher than the boiling point of alcohol. Methylglyoxal is another possible interfering substance. Direct tests on blood from persons having no contact with alcohol indicate that lactic acid, in amounts found in asphyxiation, rigor mortis or severe exercise will give results by the Heise method which would be at present interpreted as alcohol concentrations ranging from 0.05 to 0.1 per cent.

Until the specificity and reliability of chemical tests for alcohol in the blood have been established, it is our opinion that it is unwise to recommend legislation involving specific methods or figures.

JOSEPH B. SWIM.

ELTON L. MCCAWLEY.

CHAUNCEY D. LEAKE, Ph.D.

University of California
Medical School, San Francisco

REACTIONS OF EPINEPHRINE IN OIL

To the Editor:—In the February 24 issue of *THE JOURNAL* Dorwart calls attention to a severe reaction following an injection of epinephrine in oil. Because of the widespread use of this slowly absorbed epinephrine preparation and because serious reactions have occurred in the past following its administration, I feel that it is my duty, as progenitor of epinephrine in oil, to suggest an adequate explanation for these reactions and thus prevent their occurrence in the future.

Reactions to epinephrine in oil may be divided into two groups: In the first group are included local reactions. These may be divided into two different types. One type is manifested by soreness and perhaps redness and swelling. This reaction occurs at the site of injection, persists for from twenty-four to forty-eight hours and is due to the irritating free fatty acids present in the vegetable oil. During the time when I was preparing epinephrine in oil these reactions were not uncommon, but with the advent of commercial preparations they are infrequently observed. This is, perhaps, due to the fine grade of refined oil used by the commercial drug houses. The second type of local reaction is the allergic reaction, which may appear after several consecutive injections have been given. Although one might anticipate a goodly number of such reactions, I have experienced only two that might be so classified.

In the second group are included reactions that are directly referable to the epinephrine. There are also two types of reactions in this group. One type, though unpleasant, is not serious and is manifested by nervousness and tachycardia, which appears in from fifteen to thirty minutes after the injection and persists for from thirty to sixty minutes thereafter. This reaction is caused by an overdosage of epinephrine in oil. Because tolerance for epinephrine in any form varies greatly in different individuals, I have often stressed the importance of choosing cautiously the initial dose. The second type, or serious reaction, presents an alarming clinical picture and is usually manifested by prostration, severe nervousness, tachycardia, excruciating headache, extrasystoles, rise and then perhaps fall in the blood pressure, and vomiting.

In previous publications I have reported two such reactions, and subsequently I have learned of two similar ones. The case reported by Dorwart represents another.

In an attempt to explain the serious reactions which occurred in the four cases referred to, I reviewed in detail with the physicians who had made the injections the dosages employed and the technics of administration. One clue was elicited: each physician had employed an intravenous needle (18 or 20 gage) to administer the epinephrine in oil. Large gage needles are conducive to rapid administration, and it is logical to believe that the rapid introduction of an oily injectant might rupture small blood vessels and thereby permit its rapid absorption. For administering epinephrine in oil I employ a 23 or 25 gage needle, and in three years I have given nearly 5,000 injections to more than 350 different patients and have never experienced a reaction that might be classified as "severe."

Dorwart suggests the possibility that the epinephrine particles may separate out of the oil and thence be absorbed in large quantities. This is unlikely. The sedimentation of epinephrine particles in the oil is a matter of hours, not minutes. Furthermore, I cannot see how contact with water in a syringe or contact with tissue juice could speed up absorption. Epinephrine in oil is slowly absorbed because the oil is slowly diffused through the tissues and because the oil restricts contact of the tissues with the epinephrine particles. The oil likewise restricts contact of water in a syringe with epinephrine particles.

Dorwart did not mention in his article the gage of needle which he employed in making the injection of epinephrine in oil. In view of my past experiences as related, I feel that such information is important.

To prevent reactions to epinephrine following the administration of epinephrine in oil, I should like to stress that (1) the initial dose be chosen cautiously, (2) a 23 or 25 gage needle be employed in making the injection and (3) the injections be administered slowly.

EDMUND L. KEENEY, M.D., Baltimore.

"DELAYED CUTANEOUS REACTION TO INTRADERMAL INJECTION OF BRUCELLERGEN"

To the Editor:—In the February 10 issue of THE JOURNAL, under Clinical Notes, Suggestions and New Instruments, is an article by January and Greene entitled "Delayed Cutaneous Reaction to Intradermal Injection of Brucellergen in Brucellosis" in which the authors discuss the relative infrequency of this occurrence and quote other observers.

I mentioned delayed cutaneous reaction to intradermal injection of heat-killed *Brucella abortus* vaccine in an article published in the *New York State Journal of Medicine*, Dec. 1, 1934, entitled "Undulant Fever—Difficulties in Diagnosis and Treatment—A Preliminary Report of Fifty-One Cases." This article was abstracted in THE JOURNAL, Feb. 16, 1935. In the summary of the case history of A. H. on page 3 of that article it was stated: "A skin test showed a delayed positive reaction at the end of seven days." Although I cannot find that I have discussed this subject since that date except in a monograph on brucellosis not yet published, I have come to look on this unexplained phenomenon as not rare. I have noted it in five or six instances among approximately 300 cases of brucellosis diagnosed since 1932. Its importance seems so great, especially in the presence of a negative blood agglutination test and a negative blood culture, that I have made it a rule to read all cutaneous tests done with heat-killed vaccine on the fourth day and, if negative, to reread them on the seventh day. It is especially important to note cutaneous reactions accurately, since the interpretation of the opsonocytaphagic index depends on the presence or absence of a positive intradermal test.

HAROLD J. HARRIS, M.D., Westport, N. Y.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF RAYNAUD'S DISEASE

To the Editor:—Please inform me what is considered to be the proper treatment of Raynaud's disease at the present time.

E. H. Wagenaar, M.D., Portage, Mich.

ANSWER.—Patients with a mild degree of true Raynaud's disease (excluding the secondary forms due to cervical rib, spondylitis or other factors), with infrequent slight attacks limited to the winter months and without trophic changes, digital infection or focal gangrene, can be made considerably more comfortable by medical measures. For advancing Raynaud's disease a suitable sympathectomy is the treatment of choice, provided operation is done before sclerodactyly or organic changes have conspicuously reduced the capacity for dilatation. All patients with Raynaud's disease should have periodic examinations at frequent intervals, particularly in cold weather, so that significant changes in peripheral circulation may be detected before organic occlusion and trophic changes diminish the usefulness of surgical treatment.

In nervous persons the symptoms of mild Raynaud's disease may be benefited by relaxation of mental stress, psychotherapy and simple reassurance. If the basal metabolic rate is low the administration of thyroid substance or thyroxine should be tried; the dosage should be great enough to elevate the basal metabolic rate to normal. Patients who are underweight often improve under a regimen of daily rest periods and a high caloric diet. The use of tobacco should be prohibited. Moving to a warmer climate may be helpful in mild cases but is less useful in severe cases. When exposure to cold cannot be avoided, the extremities should be carefully protected and heavy clothing should be used to conserve body heat. The digits should also be protected against trauma and infection, particularly during the winter months. Acetyl-beta-methylcholine chloride (mechoyl) in doses between 0.1 and 1 Gm. by mouth prevents mild attacks or modifies severe attacks if taken shortly before exposure to cold.

For increasingly severe and progressive Raynaud's disease sympathectomy is indicated, provided appropriate skin temperature studies indicate that the capacity for vasodilatation is still good. For Raynaud's disease of the lower extremities, lumbar sympathectomy offers practically complete relief of symptoms. In treating the upper extremities cervicodorsal ganglionectomy, while sometimes helpful, is often followed by sensitization of the denervated vessels with resulting secondary vasospasm. The more recently devised operation of cervicodorsal preganglionic sympathectomy avoids the secondary vasospasm, and the results in the upper extremity have been correspondingly better in recent years, provided preoperative vasodilatation tests demonstrate good capacity for vasodilatation.

BACTERIA OF MILK

To the Editor:—What is the difference between *Bacterium lactic aerogenes* and *Lactobacillus*? What is the difference between *Lactobacillus* and *Lactobacillus acidophilus* or *bulgaricus*? Is *Streptococcus lacticus* different from *Bacillus bulgaricus* or *acidophilus*? In what way? In what American milk products do you find the predominance of *Streptococcus lacticus* with a small number of *Bacterium lactic aerogenes*? M.D., New York.

ANSWER.—Many different micro-organisms may contribute to the natural souring process in milk. Those most commonly involved fall generally into three groups, the *Bacterium* (lactis) aerogenes types, *Streptococcus lacticus* and the lactobacilli. *Bacterium aerogenes* is a gram-negative encapsulated gas producing bacillus closely related to *Bacterium coli*. It is commonly present in naturally souring milk and is believed to be particularly active in the early stages of the process. When it predominates it produces a gaseous fermentation which renders the product less palatable. It is usually overgrown, however, by the more vigorous acid producing streptococci and lactobacilli, which presumably are the chief factors in the later stages of natural souring. Both of these are gram positive. The streptococci form fairly long chains of rounded cells. The lactobacilli are rod shaped organisms usually in pairs or palisade arrangement. A number of species of lactobacilli are found in milk products. The commoner forms are *Lactobacillus bul-*

garicus and *Lactobacillus acidophilus*, which differ from each other in minor respects. However, since *Lactobacillus acidophilus* easily becomes established in the human intestine, it is claimed (Rettger, L. F., and Cheplin, H. A.: *A Treatise on the Transformation of the Intestinal Flora with Special Reference to the Implantation of Bacillus Acidophilus*, New Haven, Yale University Press, 1921) that the intestinal flora can be changed from a putrefactive to a fermentative type more readily by feeding milk products containing it. *Bacterium aerogenes* is rarely absent from commercial milk products, but the modern practice of inoculation with controlled "starters" or pure cultures keeps this organism to a low percentage of the total bacterial flora. *Streptococcus lacticus* is presumably the predominant micro-organism in buttermilk that is not labeled "Bulgarian" or "Acidophilus."

DISINFECTION AND STERILIZING AGENTS

To the Editor:—1. Is alcohol a reliable sterilizing agent and, if so, at what percentages and after how long an application? 2. Is saponated solution of cresol a reliable sterilizing agent and, if so, at what percentages and after how long an application? 3. How often should carriage lifting forceps or other lifting forceps (and container) which are used frequently be sterilized in order to maintain safe sterile technic? 4. How long will material kept dry in the container remain sterile if exposed to the air once a day or if kept tightly closed constantly? M.D., Iowa.

ANSWER.—The efficiency of chemical disinfecting or sterilizing agents is so dependent on the form and material of objects to be sterilized that it is difficult to give general answers to the first two questions.

1. Probably the most effective concentration of alcohol is 70 per cent by weight (from 80 to 82 per cent by volume). It is questionable whether immersion of objects in alcohol for several hours will sterilize, although exposure for a much shorter time may disinfect objects sufficiently for some purposes.

2. Saponated solution of cresol is also to be regarded as a disinfecting agent rather than a sterilizing agent and may be used in concentrations of 1 or 2 per cent.

3. Carriage lifting forceps should be sterilized as effectively and as often as are the objects (instruments) to be handled by them. It is common hospital practice to sterilize lifting forceps by heat once or twice a day and to keep them standing in a disinfectant such as 1 per cent saponated solution of cresol between sterilizations. The sufficiency of this technic is questionable.

4. Material sterilized and kept dry in a well covered container will remain sterile indefinitely. When the lid of the container is removed the chance of contamination is dependent entirely on the technic of handling and the amount of dust in the air. If carefully done in a room relatively free from dust, such a container may be opened many times with little danger of contamination by pathogenic organisms.

MYELOGENOUS LEUKEMIA

To the Editor:—Please inform me of any recent developments in the treatment of aleukemic myelogenous leukemia and the present accepted methods of treatment, if any. F. J. Vollmer, M.D., Howard, S. D.

ANSWER.—The treatment of aleukemic myelogenous leukemia is the same as that of myelogenous leukemia. There are no new forms of treatment. The most satisfactory treatment depends first on determining whether the leukemia is of the acute or the chronic type.

Acute myelogenous leukemia is distinguished by a relatively sudden onset, the presence of several degrees or more of fever and usually by the presence of lesions in the throat and mouth. The spleen is only moderately enlarged at first. The blood picture shows severe anemia and a high percentage of young forms in the myeloid cells. The total white cell count is not important. When it is low and few myeloid cells are present, it is termed aleukemic. The proportion of myeloblasts is usually 50 per cent or more of the total myeloid cells present.

Chronic myelogenous leukemia, on the other hand, is characterized by an insidious onset, the temperature is either normal or only slightly elevated, and the spleen is enlarged. The blood picture shows at first only moderate anemia; and although the myeloid cells are young, the proportion of myeloblasts is relatively low—from 5 to 20 per cent. The prognosis in acute leukemia is bad; death occurs in a period ranging from weeks to months, whereas in chronic leukemia it averages from three to four years.

No treatment known is of any value in acute myelogenous leukemia. Transfusions are merely supportive. In chronic leukemia, however, roentgen treatment over the long bones and spleen is usually effective. The blood picture may be improved,

and the size of the spleen decreases. Solution of potassium arsenite, given to tolerance, has a similar but less beneficial action. In aleukemic myelogenous leukemia care must be taken that the roentgen treatment does not lower the white cell count to dangerously low levels.

PARKINSON'S SYNDROME NOT RELATED TO THIAMIN (VITAMIN B₁) DEFICIENCY

To the Editor:—Can you give me any information about the subarachnoid injection of vitamin B₁ in muscular dystrophies or other central nervous system lesions? I should like to ask particularly if there is any record of this substance being used thus in the parkinsonian syndrome due to encephalitis and, if so, information about the dosage, exact substance and the technic of administration.

P. G. Hamlin, M.D., Cambridge, Md.

ANSWER.—There is no evidence that vitamin B₁ deficiency is the cause of muscular dystrophy. It is clear, however, that the deficiency of vitamin B₁ can result in lesions of the peripheral nerves, the spinal cord, the alimentary tract, the cardiovascular system and the skin. The work of Elvehjem and Spies has shown clearly that the neuritic and spinal cord lesions are associated with vitamin B₁ deficiency, that nicotinic acid deficiency is associated with pellagra-like lesions of the skin, alimentary tract and central nervous system, and that riboflavin deficiency is associated with cutaneous lesions about the nose and angles of the mouth. Thiamine hydrochloride has been tried on patients with parkinsonism, but with no beneficial effect. Moreover, there is not an iota of evidence that parkinsonism is in any way related to vitamin deficiency nor is there any good reason to use thiamine hydrochloride by subarachnoid injection. It has been demonstrated that nicotinic acid will bring about a remission of pellagra, that thiamine hydrochloride will cure beriberi and that riboflavin will heal the lesions caused by riboflavin deficiency. Thiamine hydrochloride, when needed, can be given effectively by the oral, intramuscular and intravenous routes.

References:

- The Vitamins (textbook of a Symposium on Vitamins), Chicago, American Medical Association, 1939.
- Spies, T. D.; Vilter, R. W., and Ashe, W. F.: Pellagra, Beriberi and Riboflavin Deficiency in Human Beings, *THE JOURNAL*, Sept. 2, 1939, p. 931.
- Spies, T. D.; Bean, W. B., and Ashe, W. F.: Recent Advances in the Treatment of Pellagra and Associated Deficiencies, *Ann. Int. Med.* 12: 830 (May) 1939.
- Margulis, S.: Nutritional Dystrophy: Multiple Vitamin Deficiency Disease, *Ztschr. f. Vitaminforsch.* 8: 220, 1939.

FRIGIDITY IN WOMEN

To the Editor:—I am interested in knowing the method of treatment for frigidity or lack of sexual pleasure in women. Any information you could give me and any books to which you could refer me concerning this would be sincerely appreciated. Edward N. Dunn, M.D., Moscow, Idaho.

ANSWER.—The treatment of frigidity in women depends on accurate diagnosis as to the underlying cause. In the vast majority of cases the cause lies with the husband. Impotence, either partial or complete, is one of the main causes of frigidity in the wife. The practice of withdrawal, which is stated to be a frequent method of contraception, is another cause for frigidity; the orgasm in the woman comes on as a rule much later than in the man and therefore when the husband withdraws his penis before his own orgasm it must necessarily be before the orgasm of the wife. When this practice is kept up for months or years, the wife finally becomes disgusted with the entire sexual act. In many cases the husband thinks only of himself and does not attempt to arouse any passion or desire in the wife before coitus. The treatment of this form of frigidity is education.

It must be remembered that sexual desire in the modest woman is often developed only several months after marriage, and frigidity may be considered almost normal during this period.

There is another form of frigidity due to an organic condition in women, namely partial or complete sexual anesthesia in the vaginal mucous membrane. This condition has been described by Huhner (*The Diagnosis and Treatment of Sexual Disorders in the Male and Female Including Sterility and Impotence*, Philadelphia, F. A. Davis Company). One must have experience however in making this diagnosis, as different portions of the female genital tract have different degrees of sensitivity. The treatment consists in inserting a large vaginal electrode and administering the sinusoidal-galvanic current for about ten minutes. Treatments may be given twice a week.

The absolutely frigid woman does not complain, as sex means nothing to her, so that when a woman complains it indicates that she has some sexual desire. There are of course cases of psychic frigidity in which the woman has been brought up in such a manner as to consider everything pertaining to the sex

act as bestial or degrading. Such cases are really infrequent and, if the woman marries the proper man, it will be cured in time without any treatment. This condition has been dignified by the name of "intellectual frigidity."

In chronic masturbation in women, the centers in the brain connected with the clitoris have been developed to the detriment of the centers connected with the vaginal mucous membrane. The treatment does not consist in having the husband bring on an orgasm during coitus by titillation of the clitoris but by persisting in normal coitus to develop the proper centers.

RHEUMATIC FEVER-LIKE LESIONS IN ANIMALS

To the Editor:—Has rheumatic fever been observed in animals? Have cardiac lesions, which are the sequels of rheumatic fever in the human being, been found in animals?
J. E. Schmidt, M.D., Baltimore.

ANSWER.—As far as can be ascertained from the literature, true rheumatic fever has not been observed in animals either in the natural state or artificially induced. In animals with endocarditis which have been inoculated with nonhemolytic streptococci focal myocarditis has been encountered which resembles that seen in subacute bacterial endocarditis of man; but these lesions only remotely resemble the granulomas found in true rheumatic myocarditis. Klinge (Der Rheumatismus, Munich, J. F. Bergmann, 1933) and others have also described focal myocardial lesions in animals which have received multiple injections of foreign protein such as horse serum or pig serum. Again these lesions, while having in their centers areas of "fibrinoid" degeneration, are not identical with Aschoff bodies.

Recently Loewe and Lenke (*J. Exper. Med.* 71:89 [Jan.] 1940) have described in a number of rabbits myocardial lesions which more closely resemble the endocardial and myocardial inflammation induced by rheumatic fever. They think that these lesions occurred in an epizootic among the animals under observation. Pearce (*Arch. Path.* 28:827 [Dec.] 1939) has also described recently diffuse endocardial, myocardial and pericardial lesions in rabbits inoculated with virus III and then submitted to various procedures which would tend to increase the work of the heart or to traumatize it. While these lesions would not be confused with those of rheumatic carditis, the element of trauma in causing the virus to localize in the heart is of considerable interest.

WESTERGREN SEDIMENTATION TECHNIC

To the Editor:—1. In obtaining blood sedimentation rates with the Westergren technic, what is the correct amount of 3.8 per cent sodium citrate solution to use with whole blood? Some technicians use 0.5 cc. of the 3.8 per cent sodium citrate and add 2 cc. of whole fresh blood, and others use the same amount of anticoagulant but add 4.5 cc. of whole blood. 2. Are the rates of descent fully comparable regardless of any part anemia may play? 3. What are the upper limits of normal in both if there is a difference?
M.D., Wisconsin.

ANSWER.—1. In observing the sedimentation rate by the technic described by Westergren, 3.8 per cent sodium citrate is employed in a ratio of one part of anticoagulant to four parts of venous whole blood. Therefore 1 cc. of this solution is mixed with 4 cc. of whole blood. Authors other than Westergren have modified the volume of citrate solution employed without realizing that a decreased dilution of the whole blood increases the rate of sedimentation as compared to that observed with the 20 per cent dilution used in the original method.

2. Variations in erythrocyte concentration produce less alteration of the sedimentation rate for the Westergren procedure than for technics employing anticoagulants which do not dilute the blood significantly, i. e. heparin, potassium oxalate and the mixture of ammonium and potassium oxalates. Anemia produces a moderate increase in sedimentation rate however with the Westergren method, and Gram has devised a method for correction of this effect (Gram, H. C.: *Acta med. Scandinav.* 70:242, 1929). The correction for anemia for the Westergren technic is not entirely satisfactory and is seldom employed. A more complete discussion of the entire subject has been reported (Ham, T. H., and Curtis, F. C.: *Medicine* 17:447 [Dec.] 1938).

3. Using the Westergren method (and employing the volume anticoagulant recommended by Westergren), the upper limit of normal is approximately 8 to 10 mm. of sedimentation in one hour. The usual normal limits are 3 mm. and 7 mm. in one hour for men and for women, respectively. In blood samples with decreased erythrocyte volume the values would be somewhat higher, approaching 15 mm. in one hour with significant anemia. No set figures can be given for the influence of anemia, since the sedimentation rate is influenced by both the volume of erythrocytes in suspension and by the size of the cell, i. e. whether macrocytic or microcytic (see Ham and Curtis).

ERGOTAMINE TARTRATE IN PRURITUS

To the Editor:—I should appreciate a discussion on the use of ergotamine tartrate in pruritus.
M.D., Iowa.

ANSWER.—Ergotamine tartrate, or gynergen, has some of the therapeutic properties of ergot. It has been much used in the treatment of migraine. Caution is necessary in its use because of the danger of poisoning from excessive doses or from the long continued administration of therapeutic doses. Therapeutic doses stimulate the sympathetic motor nerve endings; toxic doses paralyze them. Gangrene has resulted from its continued use. Especial caution is necessary when it is used with patients who suffer from arterial disease, because of the increase in blood pressure which it causes.

Chalier and Riou (*Serum Pruritus and Ergotamine Tartrate, Lyon méd.* 161:541 [May 8] 1938) recommended the oral administration of ergotamine tartrate in serum pruritus. Two cases of persistent urticaria successfully treated with ergotamine tartrate were reported by Thévenot (Two Cases of Persistent Urticaria Successfully Treated with Ergotamine Tartrate, *Lyon méd.* 161:339 [March 20] 1939). Neither of these reports, however, is extensive or scientifically convincing. The complications following the use of ergotamine tartrate have been fully discussed by von Storch in *THE JOURNAL* July 23, 1938, page 293. Dosages and some other pertinent data are given in an answer to a query in *THE JOURNAL* July 2, 1938, page 81.

BLOOD GROUPS OF ESKIMOS

To the Editor:—I found in the literature somewhere the statement that all pure Eskimos fall in the group I blood type. I should like to know whether or not that statement is correct or approximately so.
C. W. Henney, M.D., Portage, Wis.

ANSWER.—The statement that all pure blooded Eskimos belong to group O is erroneous. There is no single distribution of the blood groups characteristic for all Eskimos, since this people consists of isolated groups which by inbreeding have each developed characteristic distribution of their own. Three examples are the following:

Location	Percentage of Groups			
	O	A	B	AB
Cape York	80.7	12.9	2.4	4.0
West Greenland	41.1	53.8	3.5	1.4
East Greenland	23.9	56.2	11.2	8.7

For additional examples the book on Blood Groups and Blood Transfusion by Wiener (ed. 2, Springfield, Ill., & Baltimore, Charles C. Thomas, 1939, p. 201) could be consulted. The examples given show the wide disparity in the distribution of the groups in different tribes of Eskimos.

GERMICIDAL PROPERTIES OF MERCURY COMPOUNDS

To the Editor:—What would be the efficiency of a 1:1,000 solution of mercuric oxycyanide in destroying the bacillus of tuberculosis?
M.D., Idaho.

ANSWER.—Recently new methods (Brewer, J. H.: The Antibacterial Effects of the Organic Mercurial Compounds, *THE JOURNAL*, May 20, 1939, p. 2009) and new mediums (Brewer: *J. Bact.* 39:10 [Jan.] 1940) have been developed for testing the germicidal properties of mercurial compounds. These studies cast doubt on results reported in the past. Mercurial compounds are highly bacteriostatic and may prevent the growth of bacteria without killing them. Studies employing newer methods will be necessary before this question regarding the efficiency of mercuric oxycyanide in destroying the bacillus of tuberculosis can be answered.

HYDROQUINONES AND BODY FLUIDS

To the Editor:—I am doing some work on body pigments and find that the monobenzyl ether of hydroquinone crosses my path. Could you tell me if this substance exists normally in the blood or other body fluids?
Melvorton E. Trainor, M.D., Los Angeles.

ANSWER.—There is no evidence for and no reason to suspect the presence of the monobenzyl ether of hydroquinone in blood or other body fluids. It is possible that minute traces of hydroquinone or pyrocatechin or similar phenols may be present in the body fluids. The concentration of these in the blood might be increased by a high vegetable diet. Epinephrine is a pyrocatechin derivative but probably is present in systemic blood in concentrations of not higher than 1:20,000,000.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, March 16, page 1009.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part II, May 1-2; Part III, June or July, to be given in medical centers having five or more candidates desiring to take the examination. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral. Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If a sufficient number of applications were received before March 1 an examination will be held at New York, June 10-14. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Oral. Following the meeting of the American College of Physicians and in advance of the meeting of the American Medical Association. Applications must be on file six weeks in advance. Written. October 21. Applications must be on file by September 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II) for all candidates (Group B) will be conducted in Atlantic City, N. J., June 7-10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Oral. New York, June 8-10; Cleveland, Oct. 5. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Chicago, June 15-16. Applications must be on file on or before April 15. Sec., Dr. Fremont A. Chandler, 6 North Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Memphis, Tenn., Nov. 17, preceding the annual meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Cincinnati, May 17-18. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: New York, June 7-10. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., Rochester, Minn.

AMERICAN BOARD OF SURGERY: Various centers, April 1. Sec., Dr. J. Stewart Rodman, 225 South Fifteenth St., Philadelphia.

Kansas December Examination

Dr. J. F. Hassig, secretary, Kansas State Board of Medical Registration and Examination, reports the written examination held at Topeka, Dec. 12, 1939. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Thirteen physicians were licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School	(1939)	82
University of Kansas School of Medicine	(1939)	84.8
University of Minnesota Medical School	(1938)	90.1
University of Wisconsin Medical School	(1938)	90.7

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1930), (1938, 2)	Arkansas
University of Georgia School of Medicine	(1935)	Georgia
University of Illinois College of Medicine	(1938)	Missouri
University of Minnesota Medical School	(1931)	Michigan
St. Louis University School of Medicine	(1921)	Illinois
(1938), (1939) Missouri			
Washington University School of Medicine	(1935), (1937)	Missouri
Jefferson Medical College	(1934)	Penna.
Medical College of Virginia	(1931)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Stanford University School of Medicine	(1938)	N. B. M. Ex.
Northwestern University Medical School	(1939)	N. B. M. Ex.

Kentucky December Examination

Dr. A. T. McCormack, secretary, State Board of Health of Kentucky, reports the written examination held at Louisville, Dec. 5-7, 1939. The examination covered eleven subjects and included 110 questions. An average of 70 per cent was required to pass. Five candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1939)	86
University of Louisville Medical Department	(1909)	76
University of Louisville School of Medicine	(1936) 87, (1939)	84
Cornell University Medical College	(1934)	86

Twenty-four physicians were licensed by reciprocity and one physician was licensed by endorsement from August 1 through November 16. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine	(1937)	Missouri
Atlanta Medical College	(1914)	Georgia
University of Georgia School of Medicine	(1938)	Georgia
Rush Medical College	(1933)	Illinois
The School of Medicine of the Division of Biological Sciences	(1935)	Michigan
Indiana University School of Medicine	(1936)	Indiana
State University of Iowa College of Medicine	(1936)	Iowa
University of Louisville School of Medicine	(1917)	Washington
Boston University School of Medicine	(1924)	New York
Harvard Medical School	(1935) New Harp.	
New York, (1937) Illinois			
Eclectic Medical College, Cincinnati	(1938)	Ohio
Ohio State University College of Medicine	(1935) W. Virg.	Ohio
Western Reserve University School of Medicine	(1935)	Ohio
Temple University School of Medicine	(1937)	Penna.
University of Tennessee College of Medicine	(1935)	Mississippi
(1936) Tennessee			
Vanderbilt University School of Medicine	(1936), (1937)	Tennessee
(1938, 2) Mississippi			
Baylor University College of Medicine	(1938)	Texas
Marquette University School of Medicine	(1933)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Rochester School of Medicine	(1933)	N. B. M. Ex.

Maryland December Report

Dr. John T. O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held at Baltimore, Dec. 12-15, 1939. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. Thirty-eight candidates were examined, twenty-nine of whom passed and nine failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine	(1935)	78.1
(1936) 81, (1938) 84, 86, (1939) 84			
Johns Hopkins University School of Medicine	(1937)	79.
(1939) 81.1, 84, 85.3, 87, 87.4			
University of Maryland School of Medicine and College of Physicians and Surgeons	(1938) 85, (1939) 80.1,	85
Harvard Medical School	(1937) 91.1, (1939)	87.2
University of Minnesota Medical School	(1935)	78.3
New York Medical College and Flower Hospital	(1939)	87
University of Oregon Medical School	(1939)	86
Hahnemann Med. College and Hospital of Philadelphia	(1939)	78
Jefferson Medical College of Philadelphia	(1936)	83.3
Meharry Medical College	(1938)	78
University of	(1939)	83.2
McGill Univer	(1939)	85.4
Medizinische	(1924)	84.
(1925) 79, (1935) 80.4			
Christian-Albrechts-Universität Medizinische Fakultät,	(1920)	78
Kiel	(1938)	77.4
Université de Genève Faculté de Médecine		

School	FAILED	Year Grad.	Per Cent
Medizinische Fakultät der Universität Wien	(1930)	76.4
(1932) 52			
Universität Rostock Medizinische Fakultät	(1920)	74.3
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi Főiskola	(1935)	49
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1937)	73.2
Regia Università degli Studi di Messina. Facoltà di Medicina e Chirurgia	(1934)	65.4
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1935)	72
Regia Università degli Studi di Siena. Facoltà di Medicina e Chirurgia	(1936)	67.4
Université de Genève Faculté de Médecine	(1927)	53

Twelve physicians were licensed by reciprocity and nine physicians were licensed by endorsement from September 26 through November 27. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington Univ. School of Medicine	(1925), (1934)	Dist. Colum.
American Medical Missionary College, Chicago	(1903)	Illinois
Maryland Medical College	(1912)	Penna.
University of Nebraska College of Medicine	(1934)	Nebraska
New York Homeopathic Medical College and Hospital	(1930)	California
University of Rochester School of Medicine	(1916)	Penna.
Jefferson Medical College of Philadelphia	(1919)	Penna.
Temple University School of Medicine	(1934)	Penna.
University of Pennsylvania School of Medicine	(1936)	S. Carolina
Medical College of the State of South Carolina	(1916)	Virginia
Medical College of Virginia	(1916)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical	(1939)	N. B. M. Ex.
George Washington	(1937)	N. B. M. Ex.
Johns Hopkins Univ	1934, 1938, 1939	N. B. M. Ex.
Harvard Medical School	(1939)	N. B. M. Ex.
Duke University School of Medicine	(1936)	N. B. M. Ex.

Book Notices

The Tissues of the Body: An Introduction to the Study of Anatomy. By W. E. Le Gros Clark, F.R.S., Dr. Lee's Professor of Anatomy in the University of Oxford, Oxford. Cloth. Price, \$5.50. Pp. 372, with 109 illustrations. New York & London: Oxford University Press, 1939.

Until recently the teaching of anatomy has been mainly confined to the study of the end products of structural organization, that is, to the structure of mature organisms. Educators now are realizing the importance of knowledge of the fundamental principles of the growth, differentiation and structural adaptation of living tissues. This shifting focus of attention has not been much reflected in textbooks, and that is why this book was written. In his own department the author introduces the subject of anatomy to the students by course of lectures dealing with general problems of organization of living tissues. These lectures have been amplified here in book form to make available to students information which is generally found only in anatomic journals. Simple dissection with scalpel and forceps is the time honored technic in the study of anatomy. In recent years, by the construction of special apparatus, microdissection has been developed involving the use of exceedingly fine glass needles, micropipets, microspatulas and attachments whereby the points of these tiny instruments can be manipulated in the field under the microscope. Single cells can now be isolated and dissected and it is possible to study the effects of injected chemicals into the cytoplasm or the results of experimental mutilation of the cell. Recent anatomic research, especially by American anatomists, has evolved a technic which enables mammalian tissues to be studied by constructing transparent chambers in the ears of rabbits, allowing continuous observation with the use of high power objectives of the same cellular structures for months or even years. From such studies much has been learned regarding tissue growth and differentiation. Another method of demonstrating the details of living cells is that of vital staining. The study of growing tissues *in vitro* has been made possible by the technic of tissue culture which was initiated by an American anatomist, R. G. Harrison, in 1907. The author reviews the results of these methods of anatomic research under such headings as the anatomy of the cell, early development of the human embryo, the macrophage system, cartilage, ossification and the structure, growth, regeneration and repair of muscle, of blood vessels, of glands, of the skin, of the nerves and of other tissues. The author reviews, in explanation of the underlying principles of neural differentiation, the theory conceived by Kappers in 1907, to which he applied the term *neurobiotaxis*, the principle of which expresses the tendency of nerve cells to move toward the source of the impulses by which they are predominantly affected. For example, a group of nerve cells, *a*, which are mainly activated by stimuli reaching them from direction *b*, will tend gradually to shift their position toward *b*. This migratory tendency, which is manifested in embryologic as well as in evolutionary development, may lead to a displacement of nerve cells some considerable distance away from the site of their primary differentiation. The basic mechanism of *neurobiotaxis*, the author says, is an expression of some kind of tropism. The evidence suggests that it is a bio-electrical phenomenon associated with changing potentials in the developing and functioning neurons. The discussion of Kapper's hypothesis leads us to wonder how far the continued investigation of such minute quantities of electrical energy will go to explain the basis of the peculiar structure and functions of nervous tissue.

Les "pièges" de la chirurgie en diagnostic et thérapeutique: Erreurs et fautes ou faits présumés tels conditions et limites de la responsabilité. Par le Prof. E. Forgue, membre de l'Académie de chirurgie, et Prof. Almes, professeur agrégé à la Faculté de Montpellier. Cloth. Price, 120 francs. Pp. 309. Paris: Masson & Cie, 1939.

This book is concerned primarily with an exposition of surgical errors and a definition of the legal responsibilities of the surgeon. The volume is divided into three parts. The first part, consisting of seven chapters, deals with errors of observation and diagnosis, of indications for operation, and of prognosis and technic. Means of avoiding these errors are indicated and certain fundamental technical rules are given. The second part, consisting of eleven chapters, is devoted to the legal responsi-

bilities of the surgeon with particular attention to the authorization for and indications of operation, errors in asepsis and antiseptics, overlooked foreign bodies, and tetanus and burns. The third part, which is the most extensive, considers surgical disorders involving special regions of the body. The various factors influencing diagnosis and prognosis are enumerated and discussed. The authors' purpose, "to recognize one's errors and to find out their causes," has been well fulfilled. An appended bibliography would have enhanced the reference value of this book enormously.

Pioneers in Acute Abdominal Surgery. By Zachary Cope, B.A., M.D., M.S., Surgeon to St. Mary's Hospital, Paddington. Cloth. Price, \$1.75. Pp. 135, with 38 illustrations. New York & London: Oxford University Press, 1939.

This fascinating monograph is based on the Bolingbroke Lecture delivered by the author before the South-West London Medical Society in May 1938. It illustrates graphically the truism that the historian occupies a more authoritative position than the prophet, for in this monograph there are detailed the deeds of bold adventurers in surgery which, though uninviting at the time, became milestones in the successful progress of abdominal surgery. The steps leading to the successful management of obstruction of the colon, intussusception, strangulation of the intestine, perforative peritonitis, ectopic gestation and appendicitis are presented in their logical order and the figures of the medical men who were leading actors in the drama are shown in the interesting illustrations.

With the exception of Pasteur's and Lister's work leading to asepsis in surgery, perhaps the most important single contribution in the development of abdominal surgery was the development of the Lembert stitch. In 1812 Benjamin Travers published an article on the process of nature in repairing injuries of the intestine in which he stated that the ready disposition of peritoneal surfaces to adhere to one another was most important in the healing process. It was Dupuytren, however, who in his efforts to close intestinal fistulas by means of an enterotome or crushing clamp inspired Lembert to apply the principle to the wider field of end to end sutures of the intestine by emphasizing the importance of application of serosa to serosa in intestinal suture. This contribution by Lembert, "*Mémoire sur l'entérophilie*," was published in 1826.

The story of the development of the modern treatment of appendicitis is well described, beginning with the description of disease of the appendix by Addison and Bright in 1838. They not only recognized the occurrence of peritonitis from perforation of the appendix but also gave a good account of the pathology and symptoms of the primary disorders of the appendix. The first surgery carried out in connection with appendicitis was for peritonitis following its perforation. Henry Hancock in 1848 successfully operated on what was probably an appendical abscess fourteen days after the onset of the attack. A fecalith was discharged in the pus, which he said "had been impacted in and escaped by ulceration from the vermiform appendix." Nineteen years later Willard Parker advocated opening perityphilitic abscesses at an early stage in the disease. During the next fifteen years, eighty cases of operation for appendical abscess were reported. In 1884 Samuel Fenwick advocated early operation for perforation of the appendix, but it was not until the paper by Reginald Fitz in 1886 that the medical profession awoke to the importance of early diagnosis and operation before rupture of the appendix. Writing on diffuse peritonitis, Krönlein in 1886 recorded the first printed account of the removal of the appendix. His patient died. The first successful operation for removal of the inflamed appendix was performed by R. J. Hall, of New York, in 1886 but it was removed during an operation for irreducible hernia in which the inflamed appendix was found in the sac. Thomas G. Morton, of Philadelphia, diagnosed appendicitis, opened an abscess and first successfully removed the appendix. It remained for Sands, McBurney, Treves, Murphy and Senn to develop the operation and the indication for it with which the world is now familiar.

Dr. Cope's monograph is well written, has numerous quotations from the original historic articles and, in effect, follows the advice of Governor Alfred Smith, who frequently would say when controversial matters were under discussion "Let us examine the record."

Textbook of Medical Treatment. By Various Authors. Edited by D. M. Dunlop, B.A., M.D., F.R.C.P., Professor of Therapeutic and Clinical Medicine, University of Edinburgh, Edinburgh, L. S. P. Davidson, B.A. M.D., F.R.C.P., Professor of Medicine, University of Edinburgh, and J. W. McNee, D.S.O., D.Sc., M.D., Physician, H. M. the King in Scotland. With a foreword by A. J. Clark, B.A., M.D., D.P.H., Professor of Materia Medica, University of Edinburgh. Cloth. Price, \$8. Pp. 1,127, with illustrations. Baltimore: William Wood & Company, 1939.

Most textbooks on general medicine are often inadequate in practical therapeutics. Treatment is often touched on delicately and inadequately owing either to the exigencies of space or to the unwillingness on the part of the authors to tread on controversial subject matter. This book was therefore written for the express purpose of filling in that gap. Each chapter is written by a separate contributor and the editorial task is placed in the capable hands of Drs. Dunlop, Davidson and McNee. Most of the subjects covered in a general textbook of medicine are considered and particularly those of special interest to the man in general practice. The subject matter is addressed to students and practitioners and not to specialists. The material is current, down to date and conservative. Chapters on subjects like common disorders of infancy and childhood, industrial diseases and psychotherapy in general practice add considerably to the value of the book for the man in general practice. There are a number of statements and therapeutic suggestions which do not coincide with generally accepted points of view in this country but they are relatively infrequent and unimportant. The contents have been thoroughly edited and little space is wasted. At the end of the book is a special chapter on technical procedures used in treatment and a concise discussion of oxygen therapy. Many men engaged in the practice of medicine will find the information contained in this book both practical and useful. The book fulfils its modest purpose in a creditable manner and should be well received by the practitioner of medicine.

The Flowering of an Idea: A Play Presenting the Origin and Early Development of The Johns Hopkins Hospital. By Alan M. Chesney. Cloth. Price, \$1.50. Pp. 87. Baltimore: Johns Hopkins Press, 1939.

This play, written for the celebration of the fiftieth anniversary of the opening of Johns Hopkins Hospital, was presented in Baltimore May 4, 1939. The first scene is an imaginary conversation which takes place in the evening on the veranda of the country estate of Johns Hopkins in June 1866 between Mr. Hopkins and George Peabody, formerly of Baltimore but now of London. Mr. Hopkins, a Quaker who never married, does not smoke or drink except on the doctor's orders. He invites Mr. Peabody to dinner to talk over the disposition of his fortune, as he is now 71 years of age. Mr. Peabody, the story goes, has already made arrangements to leave most of his fortune to provide an academy of music and a gallery of art for Baltimore. He would like to found a university or college in Baltimore but his fortune is not large enough. The latter suggestion strikes Mr. Hopkins favorably, and before retiring he apparently writes his will providing for a hospital to form part of the medical school of a university. The second scene shows the board of trustees in session March 11, 1873, receiving a letter from Mr. Johns Hopkins pointing out that he has entrusted to their care 13 acres of land in Baltimore on which he desires them to erect a hospital. The duties of the trustees and the desires of Mr. Hopkins in relation to the hospital are broadly stated. Then the president of the board, Mr. Francis T. King, announces the members of committees authorized at a previous meeting: the building committee, finance committee, committee on by-laws and committee on miscellaneous business. The third scene shows the meeting of the board of trustees Feb. 20, 1877, at which Dr. John Shaw Billings reports on the progress he has made on the plans for the new hospital. Dr. Billings, who went abroad the previous year to study the best hospitals in Europe, has had an architect draw up layout plans of the buildings as he thinks they should be built, on the pavilion system. He estimates that the hospital as planned when furnished will cost about \$1,200,000. The board of trustees unanimously approves Billings' plans. The fourth and last scene takes place at the opening of the hospital May 7, 1889. Among those present are the governor of Maryland, the mayor of Baltimore, the surgeon generals of the Army, Navy and Public Health Service, the trustees, including L. N. Hopkins, a nephew of Johns Hopkins and secretary of the board, and two women,

the only surviving sister and the sister-in-law of Johns Hopkins. In a principal address at the opening ceremonies Dr. Billings describes the new hospital, the principles on which it is founded and the uses to which it is dedicated. Mr. Daniel C. Gilman, president of Johns Hopkins University, points out that thirteen years ago the university began its work and now the hospital the gift of the same benefactor, throws open its doors. Here science and charity, knowledge and pity, skill and sympathy are installed in the service of mankind. He compares the founding of Johns Hopkins Hospital to Guy's Hospital in London. With the university on the one hand and the hospital on the other, he asks "Is there anything wanting? Yes, there is still a great want to be supplied, an arch to rest on these pillars. An institute of medicine and surgery, a college of physicians and surgeons, a medical school, the office of which shall be to promote the training of young physicians, and the encouragement of medical science." The play closes with a brief statement by Governor Jackson, of Maryland, in which he declares the Johns Hopkins Hospital opened and dedicated to the service of mankind.

Synopsis of Pediatrics. By John Zahorsky, A.B., M.D., F.A.C.P. Professor of Pediatrics and Director of the Department of Pediatrics, St. Louis University School of Medicine. Assisted by T. S. Zahorsky, B.S., M.D., Instructor in Pediatrics, St. Louis University School of Medicine. Third edition. Fabrikoid. Price, \$4. Pp. 430, with 144 illustrations. St. Louis: C. V. Mosby Company, 1939.

Synopses of the various medical specialties can be useful when properly employed. Medical students can use them as a guide to their work. The general practitioner can utilize such a synopsis for quick and easy reference. In the present edition of this excellent work, many paragraphs have been rewritten and new sections added. More attention has been given to the material on treatment. Particular stress is laid on the clinical features of diseases. The book contains no reference to the literature, since it is intended particularly to give the student the elements of pediatrics, which can later be complemented by the employment of a more comprehensive textbook and a study of the literature. Considering the small size of the work, an abundance of excellent material is furnished.

Your Child's Food. By Miriam E. Lowenberg, Assistant Professor of Foods and Nutrition and Child Development, Iowa State College, Iowa City. Second edition. Cloth. Price, \$2.50. Pp. 299, with 14 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1939.

The problem of preparing meals for children is often complicated because of anorexia in the child, particularly in homes where the matter of eating receives undue attention and the refusal to eat is used as a method of gaining ascendancy over the parents. Consequently the preparing of food in such a way as to tempt the child's appetite is often worth while. Not only will this book aid a great deal in understanding feeding problems, but it includes many new practical ideas for feeding. The manner in which new foods should be presented to the child is discussed in great detail. Numerous recipes, as well as diets, are included so that any parent can find a selection which will suit the child's particular need. The author, because of contact with many mothers and children, and a widespread experience in matters pertaining to diet, has prepared a volume that may be recommended highly to mothers, nursery workers and nurses in pediatric hospitals, as well as to physicians.

Public Health Dentistry and Health Security: A Text-Workbook for Students and Practitioners. By Alfred J. Aglis, Sc.B., M.A., D.D.S., Assistant Professor of Oral Surgery, New York University College of Dentistry, New York. Boards. Price, \$3.50. No pagination. New York: Clinical Press, 1939.

The outlines of lectures with accompanying quiz questions, bibliographies and examination are intended as the basis of a course to fit dentists for positions in the public health service. As a pioneer effort it gives an impression of uncertainty as to subject matter and considerable superficiality in treatment of some material. This is especially striking in the section on "Health Security and Dental Socio-Economics," and particularly in the treatment of health insurance, state medicine and socialized medicine, where the bibliography includes almost nothing except the writings of insurance propagandists and the outline shows a lack of any thorough study of the subject.

Human Histology: A Guide for Medical Students. By E. R. A. Cooper, M.D., M.Sc., Lecturer in Histology, University of Manchester. With a foreword by F. Wood Jones, F.R.S., F.R.C.S., Professor of Anatomy, University of Manchester. Cloth. Price, 16s. Pp. 423, with 237 illustrations. London: H. K. Lewis & Co., Ltd., 1939.

The main purpose of this book is to familiarize the student with the subject matter so as to ensure passing examinations as well as to provide a companion textbook for pathology. The main body of the text is scanty and exceedingly didactic. More than a fourth of the volume is concerned with the nervous system and the organs of special sense. At the end of each of the twenty-one chapters there are instructions for practical exercises on the work covered. The material used for the illustrations is mainly human and many of the photographs are of low magnification. In many of these as well as in those of higher magnification the original necropsy material is so autolyzed that normal relations and structures are destroyed. Though published within the past year, the short discussions of function following some of the chapters contain antiquated ideas. As a textbook of histology it does not come up to the standard of many others already available in English.

A Laboratory Guide to Microscopic Anatomy with Directions for Laboratory Studies in Cytology, Histology, Organology, and Embryology. By Rafael Hernandez, M.D., Professor of Microscopic Anatomy, School of Medicine, Meharry Medical College, Nashville. Paper. Price, \$3. Pp. 168. Ann Arbor, Michigan: Edwards Brothers, Inc., 1939.

This is a large, somewhat cumbersome looseleaf book. The text is printed on but one side of the page and between the direction sheets one or more blank sheets are inserted for drawings. The whole field of histology and microscopic anatomy is detailed exhaustively. This makes it a sufficient guide for the particular course for which it was designed but a difficult one to adapt to any other unless the specific material described in it is available. On the whole, such a detailed laboratory guide would serve to inhibit rather than develop initiative and investigative spirit in the student. One gets the impression that if the directions are followed exactly there is nothing more that can be learned about a particular organ or tissue. In the appendix a list of group problems is included, but here again the directions for carrying out the work make it sound like just another assignment rather than an investigative problem which the students would enjoy.

Outline of Physiology. By William R. Amberson, Ph.D., Professor of Physiology, University of Maryland, Baltimore, and Dietrich C. Smith, Ph.D., Associate Professor of Physiology, University of Maryland. Cloth. Price, \$4. Pp. 412, with 177 illustrations by Norris Jones, Instructor in Scientific Illustrating, Swarthmore College, Swarthmore, Pennsylvania. Baltimore: Williams & Wilkins Company, 1939.

This little volume contains an amazing amount of fundamental information on every phase of physiology. Brief historical introductions are given for the major sections of the subject and the thesis is aptly illustrated with original drawings, diagrams and plates. While the volume is primarily intended for introduction to college biology and physiology, the medical student might very well read every word first before undertaking to digest the more complex textbooks in medical physiology. The simple but concise and scientifically accurate style will aid greatly to make the more weighty treatment of the subject comprehensible.

Cognitive Psychology. By Dom Thomas Verner Moore, Ph.D., M.D., Monk of the Order of St. Benedict, Professor of Psychology, Catholic University of America, Washington, D. C. Cloth. Price, \$3.75. Pp. 636, with illustrations. Chicago, Philadelphia & New York: J. B. Lippincott Company, 1939.

Cognitive psychology is that branch of general psychology which studies the way in which the human mind receives and interprets impressions from the external world. A complete account of the literature and a digest of all the experimental work goes beyond the scope of the present book, which is intended as a textbook for students of psychology. However, the attempt has been made to cite enough data to give reasonable basis for the conclusions presented and at the same time not to neglect important evidence of a contrary character. Because of the student's desire and right to ask of the teacher a definite stand on various problems, such a stand has been taken whenever the evidence allows it and some effort has been made to iron out the conflicts in apparently contradictory lines

of experimental evidence. The present textbook faces also metaphysical problems, because the tendency to avoid philosophical issues is unsatisfactory. This volume will be of service not only for students of normal psychology but also for students of psychiatry.

Handbook of Bacteriology for Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., Sc.D., F.R.C.P.I., Professor of Bacteriology and Preventive Medicine, University of Dublin. Fifth edition. Cloth. Price, \$4.25. Pp. 466, with 100 illustrations. Baltimore: William Wood & Company, 1939.

This book was undertaken to supply the need for a shorter textbook in bacteriology suitable for medical students and for practitioners who have not specialized in bacteriology. The author endeavors to present the practical aspects of the subject, to reduce the theoretical, and to emphasize the fact that bacteria are important to the physician not in themselves but only as the causes of disease. The student will find here the more important factors relating to bacteria as they affect man. If, when he assimilates the contents of this book, he wishes to learn still more bacteriology, he should consult a larger textbook. This book has come to be used in medical schools in various parts of the world. It has reached the fifth edition in a period of thirteen years and has been translated into the Spanish language. The present edition incorporates the new work in bacteriology which appears to the author to be sound and important to medical students. Rigorous editing and condensation of the less important matter permit this edition to occupy only twelve pages more than did the previous edition. Many of the older illustrations have been replaced and their total number increased by seven.

A Synopsis of Regional Anatomy. By T. B. Johnston, M.D., Professor of Anatomy, University of London, Guy's Hospital Medical School, London. Fourth edition. Cloth. Price, \$4.50. Pp. 462, with 17 illustrations. Philadelphia: Lea & Febiger, 1939.

Students will find in this book a reliable indication of what facts in gross anatomy are of the most importance in clinical work. The book will find its greatest usefulness when read in connection with a review study of a dissected part or of a skeleton. To encourage the student to frequent the dissecting room and to refer constantly to dissected parts while revising his work, the author has omitted illustrations from every part of the book except that dealing with the central nervous system. He advises that the book should not be consulted until the actual work of dissection has been completed and revision has been undertaken. In this edition the whole text has been revised and new material added, especially in the section on the central nervous system.

An Introduction to Human Anatomy. By Clyde Marshall, M.D., Assistant Professor of Anatomy, School of Medicine, Yale University, New Haven, Conn. Second edition. Cloth. Price, \$2.50. Pp. 388, with 257 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

This is a simple textbook written from the point of view of an anatomist. It contains, in addition to the facts of anatomy, brief accounts of the functional activities of the different organs. Instead of starting with the various tissues and cells as some textbooks do, it introduces the student immediately to gross anatomy and later comes to the finer structures. The book is well written and well illustrated, fourteen of the illustrations being in color. The aim of the author has been not to teach anatomy solely for its own sake but to show its relation to the other sciences and to point out some of its everyday applications.

Recent Advances in Hematology. By A. Piney, M.D., Ch.B., M.R.C.P., Assistant Physician, St. Mary's Hospital for Women and Children, London. Fourth edition. Cloth. Price, \$5. Pp. 312, with 42 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

The previous edition was published eight years ago. Since that time numerous advances have been made, which the author has incorporated in this edition. The text has been thoroughly revised and a few new colored plates have been added. The same general plan has been followed in the text. The chapter on anemias, leukemias, hemorrhagic diseases and hypoplastic and aplastic states of the blood-forming organs have been completely revised. The former editions of this book were well received and the present edition should enjoy the same popularity.

Miscellany

THE "EMERODS" IN THE BOOK OF SAMUEL

OTTO NEUSTATTER, M.D.
BALTIMORE

The description of the plague of the Philistines in the book of Samuel is one of the most interesting in the Bible, as it presents the one report of transmission of an epidemic from one place to others and names a distinct pathologic sign. It is, however, very hard to define what the condition was, and scores of translations have been tried to explain with what kind of morbid condition the sufferers were smitten.

In a paper read at the fifteenth annual meeting of the American Association of the History of Medicine at Atlantic City in April 1939, Church¹ brought interesting material to show the need of revising our idea of the Columbian origin of syphilis. He tried to prove not only by documentary evidence, as Sudhoff did in a series of publications, but by roentgenograms of mummies, that this theory is erroneous.

Referring to the constant confusion of yaws, leprosy and syphilis, Church gave on this occasion, as an example of the errors arising in translations, the pathologic change mentioned in Samuel in the word rendered "emerods." "Frequently," he says, "medical interpreters accept the translation of lay students without criticism or knowledge of the real meaning of the essential words involved. A good example of this error is the translation of the word 'Emerods' in II Samuel (7-8). This word originates far back of the historical times in the Bible; (the) original was 'ophelim' or 'omphelim' . . . When the Hindu Yogi thousands of years ago made this sign and said 'Om,' he was indicating the female. The word Phthallus has come over into Greek and Latin with the same significance that it has in medicine today. So, instead of Emerods, 'They had woman-man diseases on their secret parts,' and the context explains itself as an epidemic of sexual diseases."

It was not the first time that the theory was advanced that this scourge was syphilitic. In 1662 Trapp said that some understand it as lues venerea. Hensler (1783), the historian of syphilis, named it "crystalline." The German medical historian Haeser called the emerods "Condylomata at anum," which were identified with syphilitic condylomas. Friedreich in 1848 credited this interpretation of condylomas. J. F. von Meyer in his amendment of Luther's version renders it as "feigwarzen," as does also the Berlenburger Bibel, but here the insight into the meaning of the word as signifying a syphilitic alteration cannot be surmised. Jüttings Biblisches Wörterbuch, however, explains feigwarzen as "[syphilitic] ulcers or boils, like figs, or hemorrhoidal tumors."

The argument which Church gives for his hypothesis is new. The question arises, however, whether he has not committed himself in the same way for which he blames the others.

I do not want to give here a long account of the translation which the word "ophelim" or "apholim" has had through the centuries. I shall do that in a paper I am preparing on the pest of the Philistines. So far the official translations, in my opinion, are all unsatisfactory. The Protestant English Bibles, by the way, no longer translate "emerods."² This uncommon word crept into the English Bibles, including the Authorized Version of the King James Bible (1611). It is nothing but a corrupt form of the word "hemorrhoids" taken over in the fifteenth century

from the French, where the h is silent. Since the publication of the Revised Version (O. T. 1885) it has been translated by the neutral word "tumors," with a marginal note "or plagues; boils; as read by the Jews 'Emerods.'"

Following are a few remarks concerning Church's explanation. Church cites "II Samuel (7-8)." This is a mistake. The corresponding terms in Hebrew are to be found in I Samuel 5 and 6, where the plague is described with which the Philistines were stricken. The word apholim occurs in but one other passage in the Bible, the word techorim nowhere else in it.

It is a most precarious thing to compare Semitic and Aryan words. Luther has been blamed for having tried to derive the word tachs, or dachs, from the Hebrew "talas," where the covering of the ark of the covenant with badger skins is described.

Besides, where does Church get the omphalim? What is the basis of his conjecture? The Hebrew word is one word consisting of the three consonants עפ (the "im" is only the plural ending); the vowels, as will be known, are only of secondary value. They may assume great importance in the reading of the word, as is the case here. For, on the basis of vocalization, it is hinted to the reader to pronounce the word not as such but as its less objectionable synonym techorim. However, the main objection to the separation into two roots remains untouched by this.

Now ophel has a quite distinct meaning. It indicates something swollen, prominent, a hill. The southeastern hilly part of Jerusalem was therefore called "Ophel." No difference of opinion exists about this rendering, only about the pathologic alteration it is used for. Therefore the idea that a woman-man disease is meant seems absolutely void of any etymologic basis.

But the theory that it was a sexual disease, especially syphilis, is untenable from a medical standpoint. I only have to mention that the disease is described as a most violent, painful and lethal epidemic. Emerods, of course, are not such a plague, but is syphilis? If the description did not attribute such alarming symptoms to the scourge, one might, from the one other place in the Bible where apholim are mentioned (Deuteronomy 28:27), come to the conjecture that it was a skin disease of some kind. For there it is named among other cutaneous disorders. The wording of this passage is "The Lord will smite you with the boil of Egypt, and with the emerods, and with the scab, and with the itch, whereof thou canst not be healed."

But two unknown qualities do not make a known one. Supposing the word meant syphilis here, it could not indicate the same in Samuel's narrative. One has to go back to its original meaning and try to find it from this angle. The phrase "on their secret parts" may also contribute to the idea of a sexual disease. In many countries the term secret disease is a synonym for genital disorders. But the corresponding word in Hebrew is controversial. It is translated wholly otherwise: "Boils broke out on them" or "He smote them with the boils." Here nothing is said about secret places. Others specify the secret places in a way that pretty well excludes the sexual origin: in secreti parte natum, i. e. the anus. Others again think that it is a disease which was secret in that it was never known before. Some regard it as an expression pointing to the seat of the disease in a hidden place in the bowels, secret in that it is not visible. So no clue can be taken for the diagnosis of syphilis from the phrase secret places. Another argument against the supposition of a sexual disease is given by the word He smote the men of the city both small and great, and emerods broke out on them. Children will hardly have acquired a woman-man disease. In another modification of the narrative which is little known, pregnant women and infants are said to have been the most numerous victims. The milk cows whose calves had to be brought home before they were used to draw the cart with the ark were chosen as a symbol of these victims. This version would also forbid the diagnosis of woman-man disease.

1900 East Monument Street.

Dr. Neustatter was formerly director of the Museum of History of Hygiene, Dresden, Germany.

1. Church, Franklin H.: Syphilis of the Center of the Face, Bull. Hist. Med. 7:703 (July) 1939.

2. The same version is found in the edition of the American Revision Committee, New York, 1901. The note "as read by the Jews 'Emerods'" is not correct. The New Translation of the Holy Bible published with the approbation of Cardinal Gibbons, Archbishop of Baltimore, also gives the version "emerods." It is therefore the Jews, but not only the Jews the version "emerods." The widespread translation of Leiser gives "tumors."

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Agreement to Refrain from Operating Hospital; Assignability of Medical Contracts.—The defendants, a physician and his wife, were owners and operators of the Beaver Valley Hospital in Floyd County, Ky. They had contracts with numerous local industries to provide hospitalization to employees and their families, deductions being made from the wages of the men and paid to the hospital. Likewise, county patients were cared for under contract with the fiscal court. In January 1935 the defendants sold the hospital to the plaintiffs and agreed not to own or operate a hospital in Floyd County for ten years. The defendants further agreed to and subsequently did assign to the "Beaver Valley Hospital, Inc." all contracts with coal and gas companies, the United Mine Workers of America and the fiscal court. The plaintiffs, on their part, agreed to permit the defendant physician to use the facilities of the hospital for his patients. A little more than a year thereafter the defendants constructed and commenced the operation of a hospital in Knott County about 300 yards from the Floyd County line and about 10 or 12 miles from the plaintiffs' hospital. Thereafter the plaintiffs sought an injunction to restrain the defendants from violating the restrictive agreement and from a judgment in effect denying the injunction the plaintiffs appealed to the Court of Appeals of Kentucky.

The defendants contended that the restricted covenant was void because against public policy in that it undertook to suppress competition and to give the plaintiffs a monopoly. In answering this contention, the court pointed out that such covenants are recognized as legal if reasonable and limited as to territory or duration. The test of reasonableness is whether the restraint, considering the particular situation and circumstances, is such as to afford only a fair protection to the legitimate interests of the party in favor of whom it is given and not so extensive as to interfere with the interests of the public. The defendants argued, however, that this particular contract, relating to a hospital, a quasi-public institution, must be deemed invalid because prejudicial or specially injurious to the public interests. Contracts between professional men, such as physicians and surgeons, the court said, not to practice in competition with another pursuing the same calling have been frequently enforced in other jurisdictions where such contracts conformed to the rule of being only partial in their restraint, founded on a valuable consideration and reasonable in their operation, no distinction being made between such contracts and those of tradesmen. The court thought the doctrine had been too long and too firmly settled to be shaken now by holding that a private hospital is of such a public nature that a contract of its owners that they will not set up a competing hospital is against public policy. The restrictive covenant was held valid.

The defendants further argued, apparently, that their hospital was established and maintained not in Floyd County but in Knott County and hence did not constitute a violation of the restrictive agreement. It was manifest, the court said, that the location of the hospital in Knott County was chosen for the deliberate purpose of securing the industrial hospital business of Floyd County, and the evidence disclosed a very aggravated invasion of the territory which had been served by the older institution. Of the 1,008 patients that entered the new hospital up to the time that the defendant physician testified, 828 were from Floyd County. There was solicitation of business and inducement of cancellation of hospital contracts. Nurses and other employees were taken away from the Beaver Valley Hospital. It was true, the court pointed out, that the letter of the contract in respect of location of the hospital was strictly observed, but "as the meaning of the law-maker is the law, so the meaning of the contracting parties is the agreement. Words are merely the symbols they employ to manifest their purpose that it may be carried into execution.

. . . The intent developed is alone material, and when that is ascertained it is conclusive." *Whitney v. Wyman*, 101 U. S. 392. Obviously, continued the court, geography was not important in this case. The important thing was the protection against an unjust competitive encroachment. Furthermore, the instrument assigning the rights of the defendants in the hospitalization contracts with the coal mining companies concluded: "To have and to hold all the benefits therefrom, with our good will and assistance." Good will has been defined as the probability that the old customers will resort to the old place. Unquestionably, this included not only the probabilities attaching to a location but those attaching to an established business wherever it may be situated. And the sale of good will, whether in express terms, as here, or implied from the sale of the business, carries with it certain implied obligations on the part of the seller. There is at least an implied promise that the seller will not solicit the trade of old customers nor do any act that will interfere with the vendees' use and enjoyment. It is the general rule of the courts in upholding covenants of this character not only to prohibit the covenantor, who establishes a place of competitive business in close proximity to the prescribed territory, from soliciting business there but to prohibit the doing of any business within the territory irrespective of whether it is obtained by solicitation. The action of the defendants in taking and accepting the business from Floyd County was, in the opinion of the court, clearly a violation of their contract.

The defendants further sought to justify their action on the ground that the plaintiffs had breached that part of the contract which gave the defendant physician the right to have his patients cared for at the Beaver Valley Hospital. With respect to this matter, the court said that there was a maze of contradictions. There was testimony which, if taken at its face value, tended to prove gross malpractice and mistreatment of the defendant physician's patients and unprofessional and unfair treatment of the physician personally. The court concluded, however, that the defendant physician did not prove that he acted in good faith. The court believed that he precipitated and was the primary cause of the trouble which resulted in what he later deemed to be the plaintiffs' breach of contract.

The defendants further questioned the validity of their assignment of the industrial hospitalization contracts to the "Beaver Valley Hospital, Inc." It is true, the court said, that the majority of the decisions are to the effect that a corporation may not engage in the practice of medicine or surgery through licensed employees. Certainly a corporation may not engage in the practice of medicine or surgery in the sense that an individual physician or surgeon practices. The court could see no reason, however, why a corporation may not conduct a hospital and have its officers and employees perform the usual services of a hospital. The contracts in question related to hospital services and not strictly to medical or surgical services. Furthermore, while the purchasers of the Beaver Valley Hospital contemplated forming a corporation, none was formed. The individual plaintiffs were the real parties in interest and the assignments were made for their benefit. To hold them illegal on this account, the court said, would be to drop the substance for the shadow.

Equally without merit, the court continued, was the argument that as these contracts called for the personal services of the defendant physician they were not assignable. There was no legal authority to sell or bind the patients. The purpose and effect was to transfer the rights of the hospital in the contracts under which the owners were receiving considerable compensation through the collective bargaining of the several groups of employees and their employers. If the patients were complaining, the court thought that other issues would be brought into the case. But any possible invalidity of the assignment of the contracts could not justify the covenantors in operating a hospital contrary to their voluntarily assumed obligations.

In the opinion of the Court of Appeals, therefore, the plaintiffs showed their right to relief. An injunction should be issued, the court said, enjoining the defendants from receiving for medical or surgical care or treatment any person who resides or lives in Floyd County in any hospital rendering the

same or similar services which they, directly or indirectly, own, lease or operate. The judgment of the trial court was therefore reversed with the direction to enter judgment consistent with the opinion of the Court of Appeals.—*Johnson et al. v. Stumbo et al.* (Ky.), 126 S. W. (2d) 165.

Malpractice: Degree of Care and Skill Required; Idiosyncrasy to Roentgen Rays.—The defendant had treated the plaintiff for an eruption on her shoulders, arms and body, using x-rays for that purpose. She claimed that through his negligence she had been injured. She brought suit, therefore, in the superior court, Fulton County, Ga. A verdict was returned in favor of the defendant and the plaintiff moved for a new trial. From a judgment overruling her motion she appealed to the court of appeals of Georgia, division No. 2.

The plaintiff contended that the trial court erred in defining the degree of care and skill required of the defendant as "such care and/or skill and/or diligence as, under the law or similar conditions and all the surrounding circumstances is ordinarily employed by the profession generally in this locality." This charge, said the court of appeals, was error. Whether the degree of care and skill exercised in any particular case was or was not that reasonable degree prescribed by the Georgia Code was a question of fact for the jury. The jury might, however, in finding an answer to that question, consider the degree of care and skill exercised by the profession generally in the locality or community. The plaintiff contended, too, that it was error to instruct the jury that the defendant was absolved from blame if he exercised either the care, or the skill, or the diligence ordinarily exercised by the profession, whereas the true rule was that a physician must possess and exercise a reasonable degree of both care and skill. The court of appeals pointed out that in charging the jury neither the conjunctive nor the disjunctive was used but the ambiguous term "and/or." That term was calculated, said the court, to lead the jury to believe that the defendant had discharged his duty if he used either a reasonable degree of care or a reasonable degree of skill, but that he need not use a reasonable degree of both. The charge given by the trial court was therefore error.

The plaintiff contended that the charge given by the trial court was erroneous, too, in that it purported to state the standards required of a physician or surgeon, whereas the defendant, since he was a specialist, should be held to the standards of care and skill required of specialists. The court of appeals, however, found no error in this charge. The defendant, although a specialist, was nevertheless a physician. The care and skill required of him, whether in treating a patient by medicine or by x-rays, were the care and skill ordinarily employed by physicians under similar conditions.

It was error, however, the court of appeals held, for the trial court to charge the jury that the plaintiff would not be entitled to damages if by her exercise of ordinary care she could have avoided the consequences of the defendant's negligence, if any; for there was no evidence to show that any act or omission of the plaintiff could be charged to her as negligence contributing to her injury or that in the exercise of ordinary care or skill she could have prevented such injury.

The defendant contended that the plaintiff's injury, if any, was due not to the defendant's negligence but to her idiosyncrasy to x-rays. The trial court instructed the jury to consider whether she had such an idiosyncrasy and, if so, (1) whether the idiosyncrasy caused the condition from which she claimed to have suffered and (2) whether the existence of the idiosyncrasy was known to the defendant or, in the exercise of ordinary care on his part, should have been known to him. The defendant denied such knowledge or that with ordinary care on his part he should have known of an idiosyncrasy, if any existed, but the burden of proof as to that was on the defendant, the trial court instructed the jury, since a party asserting a fact has the burden of proving his assertion. The instruction, the plaintiff complained, taken in connection with other parts of the trial court's charge, was confusing and misleading to the jury. The court of appeals, however, held it to be a correct statement of the law.

The trial court instructed the jury that if it found that the plaintiff was negligent it should consider whether her negligence was the proximate cause of the injury of which she complained;

that is, whether such negligence produced the injury by a natural and continuous sequence, unbroken by any new, independent cause. This charge, the plaintiff contended, was not applicable in the case, because there was no evidence of any intervening cause, and it might lead the jury to conclude that her idiosyncrasy, if she had one, was such a new and independent cause as would destroy the legal implication of a causal relationship between the defendant's negligence and her injury. Her idiosyncrasy, if she had one, she contended, was a condition, not a cause. The court of appeals pointed out, however, that the three doses of x-rays administered by the defendant were not excessive or such as would produce injury in the absence of an idiosyncrasy and would justify the jury in finding that the plaintiff had such an idiosyncrasy as was described and that that idiosyncrasy was not only a condition of her injury but a cause of it.

The judgment of the trial court overruling the plaintiff's motion for a new trial was reversed.—*Kuttner v. Swanson* (Ga.), 2 S. E. (2d) 230.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Hiram A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 16-17. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for the Study of Neoplastic Diseases, Louisville, Ky., Apr. 11-13. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
- American Orthopedic Association, Kansas City, Mo., May 4-10. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCullough, 325 North Euclid Ave., St. Louis, Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixer, 319 ... Secretary.
- Arizona State ... son, Apr. 18-20. Dr. Leslie R. Kober, 15 E. ... Secretary.
- Arkansas Medical Association, Apr. 15-17. Dr. W. R. Brookshire, 602 Garrison ... etary.
- Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
- California Medical Association, Coronado, May 6-9. Dr. George H. Krebs, 450 Sutter St., San Francisco, Secretary.
- Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
- Kansas Medical Society, Wichita, May 15-16. Mr. Clarence G. Merz, 112 West Sixth St., Topeka, Executive Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. R. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Mississippi State Medical Association, Jackson, May 14-16. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
- Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.
- Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. B. Adams, 416 Federal Securities Building, Lincoln, Secretary.
- New Hampshire Medical Society, Manchester, May 14-15. Dr. Cadogan R. Metcalf, 5 South State St., Concord, Secretary.
- New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
- North Carolina, Medical Society of the State of, Pinehurst, May 13-15. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.
- North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Skelsey, 20 1/2 North Broadway, Fargo, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 2. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.
- Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Willson, 210 Plaza Court Bldg., Oklahoma City, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.
- Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. E. A. Hines, Seneca, Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.
- Texas, State Medical Association of, Dallas, May 13-16. Dr. H. J. Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9: 201-244 (Jan.) 1940

- Dietary Management of Diabetes. E. G. Givhan Jr., Birmingham.—p. 201.
American Medicine. M. S. Davie, Dothan.—p. 204.
Carcinoma of Colon and Rectum. E. Drennen, Birmingham.—p. 209.
Sepsis: The Doctor's Number One Problem. F. L. Chenault, Decatur.—p. 213.
Pyelitis in Infancy. W. W. Harper, Selma.—p. 216.
A Plea for the Use of U. S. P., N. F. and N. N. R. Drugs. A. R. Bliss Jr., Birmingham.—p. 217.
Blood Transfusions: Indications, Preparation, Administration. T. J. Payne, Jasper.—p. 222.

American Journal of Hygiene, Baltimore

31: 1-44 Section A (Jan.) 1940. Partial Index

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Section A

- *Study of Tuberculous Infection and Mortality in Children of Tuberculous Households. Miriam Brailey, Baltimore.—p. 1.

Section B

- Epidemic of Hydrocephalus in Group of Experimental Rabbits. R. R. Hyde, Baltimore.—p. 1.
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Investigation of Preserving Solutions for Recovery of Dysentery Bacilli from Fecal Specimens. Edna Bangsang and Calista P. Elliot, Baltimore.—p. 16.
*Experiment in Immunization Against Influenza with Formaldehyde-Inactivated Virus. R. M. Taylor and M. Dreguss, Budapest, Hungary.—p. 31.
Antigenic Behavior of Certain Hungarian Strains of Epidemic Influenza Virus. R. M. Taylor, M. Dreguss and F. De Ritis, Budapest, Hungary.—p. 36.
Antigenic Differences in Viruses from Cases of Influenza and Colds. Jeannette Chapman and R. R. Hyde, Baltimore.—p. 46.

Section C

- Further Observations on Experimental Malaria Infections in Anopheles Stephensi from Contrasting Larva Environments. P. F. Russell and B. N. Mohan, Guindy, Madras.—p. 19.

Section D

- Schistosomiasis in Irrigated Mountain Valleys of Venezuela. J. A. Scott.—p. 1.
Failure of Artificial Immunization to Influence Hymenolepis Diminuta Infections in Rats. A. C. Chandler, Houston, Texas.—p. 17.

Tuberculous Infection and Mortality in Children.—

From records of the childhood outpatient tuberculosis clinic at the Harriet Lane Home of Johns Hopkins Hospital, Brailey determined the prevalence of infection and the mortality risk to children of families containing an adult with pulmonary tuberculosis. The clinic admits only infants less than 2 years of age who are tuberculin positive or, if tuberculin negative, in household contact with an adult with pulmonary tuberculosis. The study deals only with individuals less than 15 years of age entering the household and followed only to 20 years of age. The number of families in the study was 285. The complete roster contained a number of children already dead from various causes at the time family investigation was initiated, but they are included, making a total of 1,383. Considering first the 782 children of households containing an open adult case of pulmonary tuberculosis, the smallest proportion of positive reactions (29 per cent) was encountered in children less than 1 year of age. In children aged 1 year, positive reactions were present in 64 per cent. The percentage of positive reactions was 71 for children up to 4 years of age, and for those from 5 to 9 it stands at 82; for the small group of children tested between 10 and 14 years of age it is 84. Omitting children less than 1 year of age, 77 per cent were positive to 1 mg. or less of tuberculin. For comparison,

data for 107 children in familial contact with tuberculous adults whose sputum was repeatedly negative or unknown as to bacterial status show that 8 per cent of infants less than 1 year of age reacted positively, 35 per cent of those from 1 to 4 years, 54 per cent of those from 5 to 9 and 60 per cent of those from 10 to 14. When the duration of the preceding contact was taken into consideration, exposure being counted from the onset of symptoms in the adult, 37 per cent of the children exposed to a sputum-positive case for periods of less than a month reacted to tuberculin; likewise 60 per cent of those in contact from one to three months, 63 per cent of those exposed from three to six months, 76 per cent in contact from six to twelve months and 85 per cent of those subjected to more than one year of such contact, preceding their first test, were positive. In contrast, 21 per cent of the children associated only with supposedly sputum-negative disease reacted to tuberculin after exposures varying from one to twelve months. When such contact had been present longer than one year, 56 per cent of those tested reacted to tuberculin. When prevalence of infection in children of the 285 households was compared with a similar sample of Baltimore children, the risk of infection in children less than 5 years of age in families containing a sputum-positive case was eighteen times greater for white children and eight times greater for Negro children than in the corresponding control groups. When the families contained a case regarded as sputum negative, infection risk was increased six times for the white and three times for the Negro children. Age-specific mortality rates derived by a modified life-table method for the children of the study after exposure to adult familial pulmonary tuberculosis revealed that their probability of dying from some cause before the age of 20 was 18 per cent for white children and 35 per cent for Negro children; the probability of dying from tuberculosis during the same age period was respectively 8.4 and 25 per cent. The highest mortality and highest case fatality from tuberculosis before 20 years of age occurred in infants less than 1 year of age. At this age the Negro children showed a mortality from tuberculosis from four to five times greater than the white. The lowest level of mortality from tuberculosis was between the ages of 5 and 14. For ages 15 to 19 the risk rose sharply in both races: in the Negro child it approximated the rate observed for children aged from 1 to 4; in the white child a level somewhere between the rates observed for the first year of life and for children between 1 to 4 years of age was reached. Prior to known contact, the mortality from all causes of the white families of the study was significantly higher than that of the general white population of Baltimore, while the Negro families showed a somewhat lower mortality than that of the Negro population of the city. Subsequent to the establishment of known contact, both races showed a mortality from all causes significantly higher than that expected. For children from birth to 20 years of age, in white families, the risk of dying from tuberculosis after known familial contact was increased sixteen times; and for those in Negro families the risk was eight times greater. The smaller ratio in the Negro children is due to the greater number of expected deaths from tuberculosis in this race.

Experimental Immunization Against Influenza.—Taylor and Dreguss gave one injection of a formaldehyde-inactivated influenza virus (WS) to 306 persons and kept 336 unvaccinated to serve as controls. During a mild epidemic which occurred shortly thereafter symptoms of influenza developed in fourteen (4.6 per cent) of those vaccinated and in twenty (6 per cent) of the control subjects. The difference is obviously not significant. A virus of the human influenza type was isolated during an acute attack from three of the control and one of the vaccinated persons. Blood samples taken before and after the vaccination from twenty-two persons were tested against the virus used for the preparation of the vaccine. Three showed no increase of protective antibodies as a result of the vaccination, twelve showed a fivefold increase, four a twenty-five-fold increase and three a 125-fold increase. During the course of the epidemic five influenza virus strains were isolated. These strains differed in their antigenic qualities from the virus strain used in the vaccine. This circumstance may have played a part in the apparent ineffectiveness of the vaccine.

American J. Obstetrics and Gynecology, St. Louis

39: 1-178 (Jan.) 1940. Partial Index

- Responses of Human Postpartum Uterus to Posterior Pituitary Extracts. S. Gardiner and J. T. Bradbury, Ann Arbor, Mich.—p. 1.
- *Diagnostic Significance of Endometrial Glands in Early Pregnancy. S. H. Sturgis, Boston.—p. 10.
- Specific "Toxemia," Essential Hypertension and Glomerulonephritis Associated with Pregnancy. I. Wellen, New York.—p. 16.
- Congestive Heart Failure in Pregnancy. T. W. Oppel, New York.—p. 24.
- Management of Placenta Praevia: Analysis of 260 Consecutive Cases. R. E. Arnell and W. F. Guerriero, New Orleans.—p. 32.
- *Palliative Treatment of Dysmenorrhea with Acetylsalicylic Acid, Phenacetin and Propadrine Hydrochloride. G. W. Ainlay, Fairbury, Neb.—p. 82.
- Blood Studies During Pregnancy and Puerperium. J. S. Labate, New York.—p. 87.
- Pathologic and Clinical Aspects of Adenomyosis and Endometriosis: Survey of 224 Cases. M. L. Dreyfuss, New York.—p. 95.
- *Attempt to Control Fetal Weight: Preliminary Report. L. E. Arnold, Dallas, Texas.—p. 99.
- Treatment of Metromenorrhagia with Testosterone Propionate: Preliminary Report. W. C. Sturgis, Baltimore; A. R. Abarbanel, New York, and D. S. Nader, Bogota, Colombia, South America.—p. 102.
- Inhibition of Lactation During Puerperium by Testosterone Propionate. C. H. Birnberg, L. Kurzkro and S. J. Klor, Brooklyn.—p. 107.
- Use of Testosterone Propionate in Inhibition of Lactation During Puerperium. S. L. Siegler and L. M. Silverstein, Brooklyn.—p. 109.
- Clinical Experiences with Stilbestrol (Diethylstilbestrol). C. G. Collins, J. C. Weed, B. B. Weinstein and F. R. Lock, New Orleans.—p. 117.
- Mono-Amniotic Twin Pregnancy with Living Infants. J. Parks and J. R. Epstein, Washington, D. C.—p. 140.

Endometrial Glands in Early Pregnancy.—The diagnosis of pregnancy from curettage material has generally rested on the presence of decidua vera or chorionic villi in the specimen removed. Sturgis calls attention to the importance of recognizing a characteristic pattern of increased glandular activity in the endometrium. He has found this picture consistently and early in the eleven cases that he reports. Although the group is small it suggests that the unusual secretory activity may occasionally prove to be a reliable aid in the diagnosis of gestation. This sign may be the only diagnostic sign present. When biopsies were taken on seven of the patients within six weeks from the last menstruation, neither the patient nor the doctor suspected pregnancy. In three of these seven specimens no decidua or villi were seen and the only indication of conception was found in the glands. In these three cases then the diagnosis of pregnancy would have been missed if the unusual secretory endometrial activity had not been recognized. In ten of these eleven cases an early pregnancy was confirmed by subsequent events. A subsequent miscarriage was probable in the remaining case. The tissue generally removed does not average more than 5 cu. mm. The eleven cases demonstrate that not infrequently such small pieces may be removed in early pregnancy without finding either decidual tissue or villi on microscopic study. It may be that the site of the biopsy was at a distance from implantation and that, in some of the early cases, the decidual response had not yet involved all of the functional endometrium. In any case, all eleven biopsies contained an adequate number of glands in the spongy layer showing unusual secretion to suggest a diagnosis of pregnancy. Under low power these glands are saw toothed when cut longitudinally and star shaped with many invaginations when cut across. In the spongy layer they lie crowded close together in early gestation and their general configuration is similar to that seen during the active luteal phase of the menstrual cycle. Under high power the epithelial cells lining the glands are swollen, larger and higher columnar in type than at any time in the normal menstrual cycle. This forces them to bulge into the lumen like an exaggerated goblet cell. They are filled with coarse, deep-staining granules, except at the luminal margin, where these granules are absent and a fine reticular network is seen. Their free edge, ballooning out into the lumen, usually shows a clearcut, sharp and distinct cell membrane. The nuclei are round, light staining and near the basement membrane. There are no epithelial mitoses.

Palliative Treatment of Dysmenorrhea.—Ainlay used a combination of three drugs for the palliative treatment of thirty-four cases of primary and four cases of organic or secondary dysmenorrhea. The ages of the patients ranged from 14 to 44 years. The combination treatment consisted of 5 grains (0.3 Gm.) of acetylsalicylic acid, 3 grains (0.2 Gm.) of acetophenetidin and three-fourths grain (0.05 Gm.) of propadrine hydrochloride. The value of acetylsalicylic acid as an

analgesic with little depression is well known. It is, however, ineffective for severe pain, and especially cramplike pain. Acetophenetidin, while probably possessing more analgesic properties, is apparently much more depressing in its action and seems to be especially so during menstruation. Like acetylsalicylic acid it is not capable of relieving cramplike pains. Propadrine hydrochloride increases the effectiveness of the other two ingredients but counteracts any tendency to depression afterward. It is believed but not proved entirely that propadrine hydrochloride is a marked antispasmodic and decongestant without side effects and with no possible danger for anuria or nausea. The patients were given three capsules of the combined drugs daily at the first onset of distress. The medication was continued until the third day of the period. Pain after the third day is not relieved well by the preparation and should lead one to suspect some organic lesion. The capsules were given the first month, skipped the second month and repeated the third month in an attempt to cover the variation that may be expected in some women. The results show that the combination of the three drugs is more effective in the primary type of dysmenorrhea and also if taken immediately on the appearance of symptoms. There is a marked effect within a few minutes after taking the capsule. All patients were either partially or completely relieved. The relief from physical and mental depression is often more gratifying to the patient than the relief from pain. The treatment does not depress the kidneys, nor does it influence the regularity or the amount of the menstrual flow.

Attempt to Control Fetal Weight.—Arnold points out that, excluding prematurity, most neonatal deaths are of babies having a birth weight in excess of 8 pounds (3,636 Gm.). As the fetal birth weight curve rises above 8 pounds both the fetal mortality and maternal morbidity curves also rise. Maternal weight can usually be controlled by dietary restrictions however these restrictions have no effect on fetal weight. Realizing that maternal dietary excesses do not cause fetal obesity, the most reasonable etiologic factor that presents itself is a disturbance in thyroid metabolism. Williams states that hypertrophy of the thyroid can be recognized clinically in from 65 to 90 per cent of all pregnant women. Before an organ undergoes hypertrophy there must first be an increased demand placed on that organ. If the organ is unable to meet this demand by hypertrophy and hyperplasia, a state of deficiency or decompensation develops. With this evidence as a foundation, the author gave 116 women thyroid extract orally during four or more months of pregnancy. Each patient received not less than 3 grains (0.2 Gm.) and not more than 6 grains (0.4 Gm.) daily. These patients received no other medication that could influence weight and they were told to eat a normal, well balanced diet. They were given no extradietary calcium or vitamins. The average maternal weight gain of these 116 women during the entire pregnancy was 18½ pounds (8.3 Kg.). The average fetal birth weight was 6½ pounds (3,090 Gm.). There was no fetal mortality or prematurity and no maternal mortality. The most gratifying point in the series is the fact that no baby weighed more than 7 pounds 12 ounces (3,522 Gm.) and none less than 5 pounds 11 ounces (2,590 Gm.). The mothers demonstrated no signs of hyperthyroidism, preeclampsia or eclampsia. It has been suggested that thyroid deficiency might play some part in the etiology of the toxemias of pregnancy.

American Journal of Ophthalmology, St. Louis

22: 1-126 (Jan.) 1940

- Pathology and Pathogenesis of Syphilitic Primary Optic Atrophy: Critical Review. J. E. Moore and A. C. Woods, Baltimore.—p. 1.
- Grenz Ray Treatment of Experimental Infection of Cornea. E. Galland, R. Pfeiffer and R. Thompson, New York.—p. 41.
- Evisceration of Globe with Scleral Implant and Preservation of Cornea. F. E. Burch, St. Paul.—p. 47.
- Retinal Detachment Occurring in Primary Compensated Glaucoma: Report of Three Cases. H. S. Gradle and D. Snyderacker, Chicago.—p. 52.
- Cosmetic Correction of Facial Asymmetry with Prisms. J. P. Cramer, Chicago.—p. 60.
- Studies on Infectivity of Trachoma: IX. Immunologic Aspects of Rickettsial Concept. L. A. Julianelle and J. E. Smith, Rolla, Mo.—p. 62.
- Functional Training, an Aid in Surgical Correction of Strabismus. O. B. Nugent, Chicago.—p. 68.
- Malignant Melanoma of Choroid and von Recklinghausen's Disease. S. Gartner, New York.—p. 73.

American Journal of Physiology, Baltimore

128:203-416 (Jan.) 1940. Partial Index

- Studies on Water Balance in Alarm Reaction. J. Howlett and J. S. L. Browne, Montreal.—p. 225.
- *Direct Arterial and Venous Pressure Measurements in Man as Affected by Anesthesia, Operation and Shock. P. P. Volpitto, R. A. Woodbury and W. F. Hamilton, Augusta, Ga.—p. 238.
- Relationships of Tissue (Subcutaneous and Intramuscular) and Venous Pressures to Syncope Induced in Man by Gravity. H. S. Mayerson and G. E. Burch, New Orleans.—p. 258.
- Attempt to Detect Reflex Changes in Bronchial Caliber Synchronous with Respiration. H. C. Nicholson and R. H. Trimby, Ann Arbor, Mich.—p. 276.
- Calorigenic Action of Adrenalin: Proportionality with Dose. F. R. Griffith Jr., F. E. Emery and Julia E. Lockwood, Buffalo.—p. 281.
- Sucrose Taste Thresholds of Rats and Humans. C. P. Richter and Kathryn H. Campbell, Baltimore.—p. 291.
- Effect of Acid Stimulation of Duodenum on Experimental Hyperglycemia and Utilization of Glucose. E. R. Loew, J. S. Gray and A. C. Ivy, Chicago.—p. 298.
- Error of Estimate of Blood Cell Count as Made with Hemocytometer. J. Berkson, T. B. Magath and Margaret Hurn, Rochester, Minn.—p. 309.
- Effect of Exercise on Blood Flow in Superior Mesenteric, Renal and Common Iliac Arteries. J. F. Herrick, J. H. Grindlay, E. J. Baldes and F. C. Mann, Rochester, Minn.—p. 338.
- Effect of Warm and of Cold Nasopharyngeal Irrigation on Cervical Lymph Flow. Jane D. McCarrell, Boston.—p. 349.
- Diameter of Red Blood Cells in Healthy Young Women. Eva G. Donelson, Jane M. Leichsenring and Lucille M. Wall, St. Paul.—p. 382.
- Mechanism of Inhibiting Effect of Electrolytes and Heparin on Blood Coagulation. A. J. Glazko and D. M. Greenberg, Berkeley, Calif.—p. 399.
- Respiration of Human Spermatozoa and Their Response to Various Gases and Low Temperatures. L. B. Shettles, Baltimore.—p. 408.

Direct Arterial and Venous Pressure.—Volpitto and his colleagues studied the blood pressure changes of twenty patients during surgical procedures performed under inhalation anesthesia and obtained nearly continuous tracings of the arterial blood pressure throughout each surgical procedure, lasting several hours in some instances. The tentative notions developed from their study are that: 1. Both venous and arterial contours show striking changes during surgical operation and anesthesia. 2. These changes are of two types: those presented by cases of hemorrhage or secondary traumatic shock with rapid pulse of the "empty" type, and those presented by shock of neurogenic origin with the equally low pressures, slow heart and pulse contours of an entirely different shape.

Archives of Dermatology and Syphilology, Chicago

41:193-450 (Feb.) 1940

- Cutaneous Carbohydrates: I. Normal Skin. T. Cornbleet, Chicago.—p. 193.
- The "Common Mole": Its Clinicopathologic Relations and Question of Malignant Degeneration. E. F. Traub and H. Keil, New York.—p. 214.
- Malassezia Furfur, the Cause of Tinea Versicolor: Cultivation of Organism and Experimental Production of the Disease. M. Moore, St. Louis.—p. 253.
- Search for Filtrable Viruses in Cutaneous Diseases of Unknown Etiology. F. S. Markham, St. Louis.—p. 261.
- *Pityriasis Rosea: Review of Literature and Report of 219 Cases, in Thirty-Eight of Which Convalescent Serum Was Used. H. D. Niles and Margaret M. Klumpp, New York.—p. 265.
- Lesions of Oral Cavity Caused by Physical and by Physicochemical Factors. E. S. Lain, Oklahoma City.—p. 295.
- Action of Sulfur-Containing Compounds in Arsenical and Mercurial Poisoning: Review of Use of Sodium Thiosulfate in Dermatologic Practice and Report of Experiments on Rabbits with Sodium Thiosulfate, Sodium P-Sulphydryl Phenyl Sulfonate and Sodium Formaldehyde Sulfoxylate. Kathleen B. Muir, Evangeline Stenhouse and S. W. Becker, Chicago.—p. 308.
- *Prevention of Industrial Dermatitis, with Reference to Protective Hand Creams, Soap and the Harmful Role of Some Cleansing Agents. J. V. Klauder, E. R. Gross and H. Brown, Philadelphia.—p. 331.
- Pemphigus: Experimental Studies on Thirty-Four Patients. J. H. Talbot and F. S. Coombs, Boston.—p. 359.
- Treatment of Ringworm of Scalp with Gentian Violet. W. F. Spiller, W. B. Sharp and M. B. John, Galveston, Texas.—p. 370.

Pityriasis Rosea.—Niles and Klumpp report their own observations on 219 cases. Among the many aspects discussed are the incidence in comparison with cutaneous disorders in general; the age, sex and race of patients; the duration, seasonal incidence, systemic symptoms and familial occurrence of pityriasis rosea, its possible etiology and the different types and locations of its lesions. Regarding the incidence of the herald plaque the reports of authors vary; Niles and Klumpp observed it in more than 50 per cent of 174 cases. In a review of literature the authors found no mention of the therapeutic use of immune serum in pityriasis rosea. The rarity of recurrence of pityriasis rosea suggested to them that the serum

of patients who had had this disease might possess immune properties. They followed the results of treatment of 114 of 219 patients. The patients were divided into three groups. Fifty patients were given from one to eight treatments with ultraviolet rays from a quartz mercury vapor glow lamp at intervals of from one to three times a week. For the first treatment the patients were given a dose which would produce a mild erythema. From the effect of this treatment the erythema dose for each person was determined and was given thereafter. Most of the exposures were followed by desquamation, which frequently caused the itching to become worse because of the associated dryness. The ultraviolet irradiation did not shorten the total duration; however, it had an immediate beneficial effect, as after even one or two treatments the patches became much drier and paler and seemed to peel off. Thirty-eight patients received serum. Blood was obtained from patients on the day on which they were discharged as cured. The clot was allowed to retract and the serum was drawn off and placed in the ice box until needed. In every case a Wassermann test was performed at the time the blood was drawn. When the supply permitted, 5 cc. was injected intramuscularly once, and occasionally twice, a week. Only one patient was given more than three injections. The patients who received serum soon became more comfortable; many stated that the itching ceased shortly after one injection. The twenty-six patients in the control group received only mild antipruritic topical remedies. The duration of the eruption, both from the onset to the cure and from the first treatment to the cure, was slightly shorter in the group treated with serum. The authors believe it is unjustifiable to conclude that the serum has no value until it has been used in a greater number of cases, in larger doses, at shorter intervals and in subcutaneous and intracutaneous injections.

Industrial Dermatitis.—Klauder and his collaborators maintain that trade dermatitis is caused annually in an enormous number of cases not by the substances encountered at work but by the removal of these substances with methods harmful to the skin. The authors questioned patients and persons employed in industry concerning the manner in which they washed their hands: the kind of soap used, the frequency of washing and the use of other cleansing agents, emollients and protective medicinal applications. They made surveys of factories and workshops in different industries to observe facilities provided for washing and measures employed in the prevention of industrial dermatitis. The studies emphasize the importance of mechanical devices in the prevention of industrial dermatitis and the need of education of workmen and others concerned in preventive measures, especially care of the skin and harmless methods of cleansing it. The authors discuss protective medicinal applications for the skin (protective hand creams). They give eight formulas of protective medicinal applications, comprising greasy and nongreasy preparations and those that dry leaving a film. Other protective applications (applied before working) are discussed: (1) hydrous wool fat for protecting from the carcinogenic action of mineral oils and tars, (2) different applications to prevent dermatoses from petroleum and lubricating oils, (3) bland oils to facilitate removal of paint, ink and dirt and (4) sodium bisulfite as a neutralizing and reducing agent. In the discussion of methods of cleansing the skin it is stressed that a 10 to 30 per cent solution of sodium thiosulfate and a 0.5 per cent solution of sodium metasilicate are harmless agents for removing such substances as paint, ink and dye. A formula consisting of a mixture of sulfonated neat's foot oil, liquid petrolatum and corn meal is given as a substitute for mechanic abrasive soap. In the discussion of the action of soap on the skin the authors take up mechanic soap and its ingredients, toilet soap, neutral soap, soaps for household and laundry purposes, soap fillers, silicates of sodium, the allergenic action of soap and soap as a primary cutaneous irritant. Soap is not sufficiently soluble, as employed for toilet or laundry purposes, to permit the alkaline salts it contains, especially sodium carbonate, in sufficient concentration in soap solution to act as cutaneous irritants. Exceptions are soaps in powder form mixed with sodium carbonate. The authors also evaluate detergents other than soap: triethanolamine soap, naphthenic acid soap and sulfonated oils. Formulas of different

combinations of sulfonated olive oil, sulfonated neat's foot oil, gelatin and liquid petrolatum and one containing sodium lauryl sulfate are proposed as soap substitutes. Sulfonated esters, sulfonated ethers and sulfonated alcohols have extensive use in industry, but there are few data available as to their use as detergents for human skin. The detergent property of vegetable meals is not sufficiently appreciated. They mention oat meal flour, almond meal (sweet almond) and powdered bitter almond, powdered soap tree bark (*quillaja*), powdered orris root and to a lesser degree flaxseed meal. When these substances are used with water to cleanse the hands the result is relatively satisfactory.

Archives of Neurology and Psychiatry, Chicago

43: 195-428 (Feb.) 1940

- Experimental Disseminated Encephalopathy in the Monkey. A. Ferraro and G. A. Jervis, New York.—p. 195.
- Pick's Disease with Atrophy of Temporal Lobes: Clinicopathologic Study. N. Malamud and D. A. Boyd Jr., Ann Arbor, Mich.—p. 210.
- *Variations in Carbon Dioxide Content of Blood in Epilepsy. E. L. Gibbs, W. G. Lennox and F. A. Gibbs, Boston.—p. 223.
- Epileptogenic Lesions of Brain: Histologic Study. W. Penfield and S. Humphreys, Montreal.—p. 240.
- Adjustment of Acid-Base Balance of Patients with Petit Mal Epilepsy to Overventilation. L. F. Nims, New Haven, Conn.; E. L. Gibbs, W. G. Lennox, F. A. Gibbs, Boston, and D. Williams, London, England.—p. 262.
- Physiology of Concussion. W. W. Scott, Chicago.—p. 270.
- Sinothalamic Tract in Man. A. E. Walker, Chicago.—p. 284.
- *Remissions in Epileptic Patients Treated with Sodium Bromide in an Outpatient Clinic. T. T. Stone and A. J. Arieff, Chicago.—p. 299.
- Flaccid Hemiplegia in Man. C. D. Aring, Cincinnati.—p. 302.
- Evaluation of Metrazol Shock in Treatment of Schizophrenia: Report of Results in 100 Cases. L. Reznikoff, Secaucus, N. J.—p. 318.
- Production and Localization of Headache with Subarachnoid and Ventricular Air. T. J. C. Von Storch, L. Secunda and C. M. Krinsky, Boston.—p. 326.
- Effects of Ethyl Alcohol on Cerebral Cortex and Hypothalamus of Cat. J. H. Masserman and L. Jacobson, Chicago.—p. 334.
- Changes in Electro-Encephalogram During Metrazol Therapy. P. A. Davis, Boston, and W. Sulzbach, Waverley, Mass.—p. 341.
- *Possible Etiologic Role of Arsenic in Disturbances of Central Nervous System Attributed to Avitaminosis, with Special Reference to Pellagra: Report of Case with Autopsy. M. Scott and E. E. Aegerter, Philadelphia.—p. 356.
- Syphilitic Cerebral Hypertrophic Pachymeningitis: Clinicopathologic Studies in Case. G. B. Hassin and H. Zeitlin, Chicago.—p. 362.
- Folie à Deux: Report of Case of Remission from a Psychosis of More Than Twenty-Five Years' Duration. Beatrice Postle, Columbus, Ohio.—p. 372.

Carbon Dioxide Content of Blood in Epilepsy.—Gibbs and his associates determined the concentration of carbon dioxide, oxygen, sodium and potassium in the arterial and the internal jugular venous blood of patients with epilepsy. These studies were performed between seizures and the relation between clinical and subclinical seizures was observed. Whereas the concentrations of oxygen, sodium and potassium were normal in epileptic persons, the values for carbon dioxide in both the arterial and the internal jugular blood were abnormal in the following respects: 1. The carbon dioxide content of arterial and internal jugular blood drawn without relation to seizures was abnormal (lower or higher than normal) in 70 per cent of ninety-four patients. 2. In patients subject to petit mal seizures, carbon dioxide values tended to be abnormally low, whereas in those subject to grand mal seizures they tended to be abnormally high. 3. Spontaneously occurring grand mal and petit mal seizures were preceded by abnormal fluctuations in the carbon dioxide content of arterial and internal jugular blood, the time relations being such as to indicate a causal linkage between the carbon dioxide content of the blood and the seizures. These observations are consistent with electro-encephalographic evidence that the type of cerebral dysrhythmia present in grand mal seizures is in contrast to that in petit mal attacks and that carbon dioxide has a pronounced influence on cortical rhythms. All the available evidence indicates that carbon dioxide plays a significant part in the causation of epilepsy.

Sodium Bromide for Remissions in Epileptic Patients.—Stone and Arieff obtained complete cessation of attacks in forty-seven of ninety-eight epileptic patients during treatment with sodium bromide. These patients were seen at regular intervals for at least six months. Forty-seven of the patients suffered from grand mal and fifty from both grand and petit mal attacks and one from petit mal attacks. The disease was classified as idiopathic in sixty-nine, as organic in nineteen and

as focal in ten. Thirty-eight of the patients were free from attacks from the beginning of treatment. Three of these patients were treated less than a year. Sixteen had had a remission of from six to twelve months, twelve from one to two years, seven from two to three years, two from three to four years and one for eight years. In nine other cases, attacks returned and then a terminal remission occurred. In six of these cases the duration of remission was from six to twelve months, in two from one to two years and in one for three years. Thirty-three additional patients had remissions but these were followed by exacerbations. Some of the remissions lasted for from months to years. In some cases the exacerbation occurred because the patient discontinued medication without permission. The presence of a single attack constituted an exacerbation. The remaining eighteen patients were recalcitrant to all forms of therapy in that a remission did not follow, although the number of attacks was diminished. The percentages of terminal remissions in cases of the idiopathic, focal and organic type of epilepsy were 49, 40 and 45 respectively. Remissions appeared to be more readily obtained in cases of grand mal attacks. There was no correlation between the age at which the convulsive state ensued, the duration of the disease, the number of previous attacks and the prognosis. Twenty-five of the patients were given phenobarbital in conjunction with sodium bromide but in only one of them did it appear of assistance in causing the remission. It seems that, when sodium bromide is ineffective in producing a remission, phenobarbital is also without effect.

Arsenic, Disturbances of Central Nervous System and Pellagra.—Scott and Aegerter report a case in which the condition from microscopic and clinical studies could be diagnosed as either pellagra or vitamin B deficiency. An abnormal amount of arsenic was found in the urine. This suggests to them that before a diagnosis of vitamin B deficiency or of arsenic poisoning is made both factors must be considered. Experiments are now in progress to investigate whether chronic ingestion of inorganic arsenic may be concerned in the etiology (primary or secondary) of pellagra and other vitamin deficiencies.

Arkansas Medical Society Journal, Fort Smith

36: 197-220 (Feb.) 1940

- Importance of Differential Diagnosis of Lesions in Anus, Rectum and Lower Sigmoid Colon. R. E. Crigler, Fort Smith.—p. 197.
- Some Problems in Rectal Diagnosis. H. E. Murry, Texarkana.—p. 203.
- Adenoma of Rectosigmoid and Its Relationship to Carcinoma of Rectum. H. G. Hummel, Little Rock.—p. 203.

Bulletin New York Academy of Medicine, New York

16: 51-126 (Feb.) 1940

- Treatment of Gonadal Hypofunction. E. L. Sevringhaus, Madison, Wis.—p. 53.
- Puberty, Menstruation, Pregnancy. R. T. Frank, New York.—p. 83.
- Physiology and Psychology of Convalescence. O. H. P. Pepper, Philadelphia.—p. 98.
- Convalescence of Old-Age Patients. L. F. Barker, Baltimore.—p. 103.

Canadian Public Health Journal, Toronto

31: 1-50 (Jan.) 1940

- Some Observations on Control of Communicable Diseases. N. E. McKinnon, Toronto.—p. 1.
- Elimination of Smallpox in Montreal by Vaccination. A. Gresh, Montreal.—p. 6.
- Application of Phage Typing to Strains of *Bacillus Typhosus* Recovered from Typhoid Fever. K. F. Brandon, Hartford, Conn.—p. 10.
- *Low Mortality Rate from Tuberculosis in the Jewish Race. F. Gagnon, Montreal.—p. 13.

Low Mortality Rate from Tuberculosis in Jewish Race.—Gagnon states that since 1911, the health department of Montreal has classified the deaths according to the racial origin of the population. This classification has shown a decidedly lower mortality rate in the Jewish race not only from all diseases but also from tuberculosis. During the last twenty years the average mortality rate from tuberculosis among the Jews has been only 40 per cent of the rate for the entire population. If comparison had been made between the rate for the Jewish population and the rate for the rest of the population, the difference would be even more accentuated. The author believes that the following factors may account for at least a part of the wide difference: 1. The last census showed that 60 per cent of the Jewish population of Montreal is foreign born. These immigrants were medically examined before entering the country and they constitute a select group as far as health is concerned.

2. The Jewish group of the population has limited social relations with other groups. 3. The Jewish community is the ethnical group provided with the best means of protection against tuberculosis. Their number represents only about 6 per cent of the total population but their subscription for public charities exceeds 18 per cent of the total. Therefore destitute Jews are better provided for than any of the other groups of the population. 4. Occupation plays an important part in the spread of tuberculosis. Only a small proportion of the Jewish population is occupied in heavy outside work and therefore affected by extreme variations in temperature. 5. The Jew sacrifices luxuries for the necessities of life, allows himself a wholesome and varied diet, does not abuse alcoholic beverages, is inclined to take care of his health and seeks early treatment for ailments.

Florida Medical Association Journal, Jacksonville

26: 317-372 (Jan.) 1940

- Gastric and Duodenal Surgery. R. A. Gowdy, Miami Beach.—p. 331.
Importance of Case Records Relative to Cancer Problem. R. L. Elliston, Fort Lauderdale.—p. 336.
Water and Salt Metabolism. K. Hanson, Jacksonville.—p. 341.
Injuries At or Near the Wrist. J. A. Simmons, Arcadia.—p. 345.
Cooperative Management of Allergic Rhinitis. A. R. Hollender, Miami Beach.—p. 347.

Georgia Medical Association Journal, Atlanta

29: 1-48 (Jan.) 1940

- Treatment of Sterility. C. B. Upshaw, Atlanta.—p. 1.
Rupture of Spleen: Report of Case. H. L. Cheves, Union Point.—p. 6.
Use of Sulfanilamide and Sulfapyridine in Pediatric Practice. J. Yampolsky, Atlanta.—p. 9.
Dr. Crawford W. Long. C. C. Harrold, Macon.—p. 23.
What Constitutes Adequate Treatment of Syphilis? S. J. Sinkoe, Atlanta.—p. 28.

Indiana State Medical Assn. Journal, Indianapolis

33: 55-116 (Feb.) 1940

- Postoperative Pulmonary Complications and Carbon Dioxide Inhalation Therapy. F. W. Clement, Toledo, Ohio.—p. 55.
Cause, Prevention and Treatment of Atelectasis. E. G. Galbraith, Toledo, Ohio.—p. 57.
Oral and Plastic Surgery. J. E. Schaefer, Chicago.—p. 60.
Heart Neuroses, Their Diagnosis and Treatment. R. G. Moore, Vincennes.—p. 66.
Surgical Importance of Renal Anomalies. M. G. Schulhof, Muncie.—p. 69.
Tularemia: Report of Two Cases. A. Henderson, Ridgeville.—p. 73.
Ectocyesis or Ectopic Pregnancy. F. H. Green Jr., Rushville.—p. 74.

Journal of Aviation Medicine, St. Paul

10: 159-246 (Dec.) 1939

- Analysis of Physiologic and Psychologic Characteristics of 200 Civil Air Line Pilots. R. A. McFarland, A. Graybiel, Boston; E. Liljencrantz, San Francisco, and A. D. Tuttle, Chicago.—p. 160.
*Toxicity of Carbon Monoxide at High Altitudes. J. W. Heim, Dayton, Ohio.—p. 211.
Psychology and Aviation. W. A. Carlson, Randolph Field, Texas.—p. 216.

Toxicity of Carbon Monoxide at High Altitudes.—Heim studied the toxicity of carbon monoxide at reduced barometric pressures. The deleterious effects of carbon monoxide on the human organism are due to its combining with hemoglobin to the exclusion of oxygen, thus reducing the uptake of this gas by the blood, and because it hinders the use of the oxygen which does succeed in getting into the blood by interfering with its liberation from oxyhemoglobin. Both phenomena act additively to produce oxygen lack in the tissues. In the study of the toxicity of carbon monoxide the magnitude of each of the two actions must be evaluated. The effects can be predicted through theoretical calculations based on physicochemical laws governing the combination of carbon monoxide and oxygen with hemoglobin, which have been formulated by Haldane and his associates. Studies show that a concentration of 0.01 per cent of carbon monoxide in the air at 10,000 feet reduces the oxygen-carrying capacity of the hemoglobin by 10.5 per cent, thereby bringing the blood into a state of anoxemia. It is thus apparent that a concentration of carbon monoxide which is innocuous at sea level becomes dangerous at 10,000 feet. The action of carbon monoxide in reducing the arterial oxygen saturation is only part of the deleterious action of this gas on the organism. The second effect, that of hindering the dissociation of oxyhemoglobin in the tissues, may equal or even exceed the former in producing symptoms of anoxemia. The action in this case is

caused by an alteration in the shape of the oxygen dissociation curve. The combined effect of these two factors will be to reduce still further the altitude tolerance. Therefore it is imperative that not a trace of carbon monoxide should be permitted to exist in airplane compartments at even moderate altitudes.

Journal of Infectious Diseases, Chicago

66: 1-96 (Jan.-Feb.) 1940

- Normal Fecal Flora of Infants Between Two Weeks and One Year of Age: I. Serial Studies. M. L. Snyder, Denver.—p. 1.
Preparation of Brucella Abortus Plate Antigen and Some Factors Affecting Sensitivity of Antigen. M. H. Roepke and C. P. Fitch, St. Paul.—p. 17.
Analysis of Tubercle Bacillus and Its Natural Products by Immune, Allergic and Anaphylactic Tests. H. J. Corper, Denver.—p. 23.
Studies on Herpes Simplex Encephalitis in Rabbits: I. Therapeutic Effect of Vitamin C, Sulfanilamide and Pitressin. J. Flexner, M. Chassin and I. S. Wright, New York.—p. 30.
Study of Serologic Principle for Separation of Mixtures of Bacterial Species, with Preliminary Application to Isolation of Typhoid Bacilli from Feces. J. H. Hanks, R. B. Houlihan and L. W. Parr, Washington, D. C.—p. 33.
Local Formation of Antivaccinial Antibodies by the Skin. G. Hartley Jr., Chicago.—p. 44.
Studies on Infectivity of Vaccinal Elementary Bodies. D. H. Sprunt, W. Marx and J. W. Beard, Durham, N. C.—p. 53.
Dissociation in Candida Albicans. J. E. Mackinnon, Montevideo, Uruguay.—p. 59.
Effect of Indole 3 Acetic Acid on Multiplication of Escherichia Coli and Eberthella Typhosa. T. D. Beckwith and E. M. Geary, Los Angeles.—p. 78.
Studies on Streptococci of Bovine Mastitis. L. W. Slanetz and J. Naghski.—p. 80.
Isolation of Brucella from Lymph Nodes. Mary A. Poston and P. B. Parsons, Durham, N. C.—p. 86.
Studies on Listerella: I. Listerella Strain Isolated from a Premature Bovine Fetus. R. Graham, H. R. Hester and N. D. Levine, Chicago.—p. 91.

Journal of Lab. and Clinical Medicine, St. Louis

25: 333-444 (Jan.) 1940. Partial Index

- *Effect of Alkalosis on Blood Picture in Chronic Splenomyelogenous Leukemia. R. D. Barnard and P. W. Ross, Chicago.—p. 345.
Observations on Reducing Substances in Blood Plasma of Rheumatisants. R. Dandurand, Montreal, C. W. Scull and R. Pemberton, Philadelphia.—p. 348.
*Sputum Studies in Pneumonia: Effect of Sulfanilamide. A. W. Frisch, Detroit.—p. 361.
Treatment of Benign Prostatic Hypertrophy with Testosterone Propionate. A. Trasoff, Philadelphia.—p. 377.
Comparative Iodine Content of Blood and Cerebrospinal Fluid. K. P. Klassen, Ruth L. Bierbaum and G. M. Curtis, Columbus, Ohio.—p. 383.
Intubation Studies of Human Small Intestine: XVI. Bacterial Flora of Ileum Compared with That of Throat and Stomach in Normal Subjects. Anna C. Nichols and P. M. Glenn, Philadelphia.—p. 388.
Determination of Acetylsulfapyridine: I. J. V. Scudi and H. J. Robinson, Rahway, N. J.—p. 404.
Id.: II. J. V. Scudi and H. J. Robinson, Rahway, N. J.—p. 409.
Use of Honey as Levulose Tolerance Test. J. B. Greco, Minas Gerais, Brazil, South America.—p. 420.

Alkalosis and Leukemia.—Barnard and Ross observed the blood pictures of two male patients with chronic splenomyelogenous leukemia during the administration of large doses of sodium bicarbonate. That an alkalosis was actually induced in these cases was based on the appearance of bradypnea, prostration and generalized anasarca during the administration of the alkali and its subsidence on the cessation of alkali administration. The authors believe that the clinical picture of alkalosis is a much better criterion for the development of this state than the determination of blood pH . The induced alkalosis did not stimulate myeloblastic activity as determined from a study of the patients' myelograms. In fact, there seemed to be a tendency toward inhibition of leukopoiesis during this period. Since myeloblastic activity in this condition is presumably neoplastic, it is concluded that this study has furnished evidence against the relationship of alkalosis to neoplasia.

Effect of Sulfanilamide on Pneumococci in Sputum.—Frisch studied the effect of sulfanilamide on the pneumococci in the sputum of patients with pneumonia. The administration of sulfanilamide caused a decrease of encapsulated pneumococci in the sputum within twenty-four to thirty-six hours. In some cases the bacteriostatic effect was maintained for from two to four days, at which time the pneumococci again reappeared in the sputum. This reappearance suggested that the organisms had become refractory to the action of sulfanilamide. This fact must be considered in the evaluation of therapy because of its possible influence on the clinical course of the pneumonia. The clumping of encapsulated pneumococci in the sputum of sulfanil-

amide-treated cases at some time during the course of the disease would seem to indicate that the development of active immunity also plays a role in the outcome of the pneumonia. According to the changes in the sputum, the value of sulfanilamide in the treatment of pneumonia seems to depend on its limited ability to inhibit the growth of the pneumococci during the time necessary for the patient to develop his own immune response or to permit a partially immune but overwhelmed host to mobilize his defensive forces effectively.

Journal-Lancet, Minneapolis

60: 45-94 (Feb.) 1940

- Diagnosis of Pneumonia. H. A. Reimann, Philadelphia.—p. 45.
Pathogenesis and Pathology of Lobar Pneumonia. C. G. Loosli, Chicago.—p. 49.
Present Status of Treatment of Pneumonia. M. Finland, Boston.—p. 54.
Control of Pneumonia. W. D. Sutliff, New York.—p. 57.
Minnesota's Oldest Medical Journal. J. Eckman, Rochester, Minn.—p. 60.
Botulism in South Dakota. C. A. Hunter, J. E. Weiss and C. L. Olson, Vermillion, S. D.—p. 67.
Student Health Service and Medical Practice. C. E. Shepard, Stanford University, Calif.—p. 70.
A Message from the Dead. H. C. Sweany, Chicago.—p. 73.

Journal of the Mount Sinai Hospital, New York

6: 233-302 (Jan.-Feb.) 1940

- New Light on Biologic Role of Vitamin E. H. M. Evans, Berkeley, Calif.—p. 233.
Palliative Partial Gastrectomy for Cardiac Gastric Ulcers. R. Colp, New York.—p. 245.
Acute Yellow Atrophy of Liver Following Sulfanilamide Therapy and Avertin Narcosis. R. Ottenberg, New York.—p. 249.
Calcified Protruded Intervertebral Disk. I. Cohen, New York.—p. 255.
Aneurysm of Aorta Due to Rheumatic Fever. A. M. Master and S. Dack, New York.—p. 259.
Nephrotic Syndrome in Diabetes. S. Siegal, New York.—p. 264.
Chemical Studies on Moccasin Venom: II. Dialysis and Attempts at Fractionation of Hemorrhagic and Hemolytic Components. S. M. Peck and W. Marx, New York.—p. 271.

Moccasin Venom.—Peck and Marx studied the effects of dialysis and of precipitation with different concentrations of ammonium sulfate and with alcohol and acetone on the hemorrhagin and hemolysin principles of moccasin venom. Pseudo-crystalline crude venom contains about 14 per cent nitrogen. In 2 per cent solution it gave a positive biuret and xanthoproteic reaction, was coagulated by heat and was precipitated by tannic acid, trichloroacetic acid, ethyl alcohol, acetone and from 0.3 to 0.6 saturation with ammonium sulfate. About one half of its dry weight was not dialysable through cellophane 300. The experimental results suggest that the hemorrhagin and hemolysin of moccasin venom are proteins or are associated with proteins. Practically no hemorrhagic or hemolytic activity was associated with the venom lipoids or carbohydrates or with dialysable venom constituents of smaller molecular size. The electrophoretic behavior of the hemorrhagin and hemolysin of moccasin venom showed that both of them were amphoteric. Apparently different in nature from these two constituents, the antihemorrhagic principle of moccasin venom was found, partially purified, in the dialysed supernatant liquid of a native venom solution precipitated at 0.8 saturation with ammonium sulfate. This fraction was free of hemolysin, and its hemorrhagin content was small. In clinical use it was found to be somewhat less effective for the control of certain hemorrhagic diseases than native venom. However, the undesired allergic cutaneous reactions, found after injection of native venom, did not develop in the great majority of cases after this fraction was injected, probably because of its low protein content, proving useful in cases difficult to desensitize.

Journal of Nervous and Mental Disease, New York

91: 141-276 (Feb.) 1940

- Poetry in Schizophrenia and Other Psychoses. L. Kerschbaumer, St. Peter, Minn.—p. 141.
Comparison of Medical and Surgical Treatment in Hypertension, with Special Reference to Importance of Psychic Factors in Evaluating Results: Report of Ninety-Two Cases Treated Medically. S. K. Blumenthal, Chicago.—p. 157.
Insulin Shock Therapy in Kretschmer's Psychosis. P. C. Talkington and T. H. Chavira, Dallas, Texas.—p. 175.
Neuroleptic Pain Shock-Diluted Water. A. N. Foxe, New York.—p. 184.
Sedative Verbalization of Anxiety. L. B. Misch, St. Louis.—p. 194.

Journal of Pharmacology & Exper. Therap., Baltimore

68: 1-216 (Jan.) 1940. Partial Index

- Prolonged Administration of Large Doses of Acetanilid in Monkeys, with Special Reference to Blood Changes. P. K. Smith, New Haven, Conn.—p. 1.
Studies of Two New Substituted Vinyl Barbituric Acids. J. P. Hendrix, Philadelphia.—p. 22.
II. Effect of Intravenous Injections of Sodium Diphenyl Hydantoinate (Dilantin) on Respiration, Blood Pressure and Vagus Nerve. V. G. Haury and M. E. Drake, Philadelphia.—p. 36.
Use of Pentamethylenetetrazol (Metrazol) as Respiratory Stimulant in Acute Alcoholic Depression. F. D. McCrea and H. M. Taylor, Durham, N. C.—p. 41.
Passage of Bromide, Iodide and Thiocyanate into and out of Cerebrospinal Fluid. G. B. Wallace and B. B. Brodie, with assistance of S. Leshin and E. Brand, New York.—p. 50.
Some Tetrahydroisoquinolines: Note on Relative Lethal and Circulatory Effects of Some 2-Alkyl Derivatives. A. M. Hjort, E. J. deBeer and D. W. Fassett, Tuckahoe, N. Y.—p. 69.
Some New Aspects of Morphine Action: Effect on Intestine and Blood Pressure: Toxicity Studies. D. Slaughter, Dallas, Texas, and E. G. Gross, Iowa City.—p. 96.
Id.: Effects on Pain. D. Slaughter and D. W. Munsell, Dallas, Texas.—p. 104.
Cardiovascular Changes Following Intravenous Administration of Barium Chloride. P. K. Smith, A. W. Winkler and H. E. Hoff, New Haven, Conn.—p. 113.
Toxicity of Lasiocarpine. K. K. Chen, P. N. Harris and H. A. Schultz, Indianapolis.—p. 123.
Action and Toxicity of Platyphylline and Seneciophylline. K. K. Chen, P. N. Harris and C. L. Rose, Indianapolis.—p. 130.
Studies on Mechanism of Protective Action of Xanthine Against Carbon Tetrachloride Poisoning. J. C. Forbes and E. L. Outhouse, Richmond, Va.—p. 185.
Comparative Effects of Propylene Glycol, Other Glycols and Alcohol on Liver Directly. H. W. Newman, W. Van Winkle Jr., N. K. Kennedy and M. C. Morton, San Francisco.—p. 194.
Experimental Comparison of Sulfanilamide and Benzylsulfanilamide, with Particular Reference to Significance of Variations in Experimental Technique. J. S. Lockwood and H. J. Robinson, Rahway, N. J.—p. 201.

Kentucky Medical Journal, Bowling Green

38: 1-46 (Jan.) 1940

- Some of the Difficulties of Medical Leadership. H. H. Shoulders, Nashville, Tenn.—p. 2.
Further Observations on Undulant Fever in Respiratory Tract. O. A. Beatty, Glasgow.—p. 4.
Removal of Ureteral Calculi per Vaginal Route. M. Casper, Louisville.—p. 8.
Appendicitis, with Reference to Mortality. J. A. Kirk, Louisville.—p. 11.
Henoch's Purpura. B. W. Smock, Louisville.—p. 16.
Treatment of Artificial Menopause. R. I. Lee, Boston.—p. 19.
Blood Dyscrasias Associated with Angina. M. L. Rich, Covington, and L. Bach, Newport.—p. 23.
The Psychiatrist's Responsibility to Society and the So-Called Criminal Insane. T. J. Crice, Louisville.—p. 26.
Intrapleural Pneumolysis. A. E. Grimes, Lexington.—p. 33.
Modern Management of Rectal Fistula. R. C. Alley, Lexington.—p. 39.
Immediate Prognostic Sign of a Smallpox Take. R. Cohen, Louisville.—p. 40.

Undulant Fever and the Respiratory Tract.—Beatty studied ninety-two cases of undulant fever, giving particular attention to the respiratory symptoms and manifestations. He found that 25 per cent of the patients had marked pulmonary symptoms and that the eighteen who had roentgenograms of their chests taken showed pulmonary changes, the most frequent type of change being hilar and peribronchial infiltration. Thickened pleura and pleural adhesions, a bronchopneumonic lesion and two instances of bronchiectasis were also visualized. The pulmonary changes in brucellosis are similar to those associated with chronic sinusitis.

Immediate Prognostic Sign of a Smallpox Take.—Cohen describes a sign which will enable a physician to prognosticate the take as soon as he has finished the vaccination. The author states that he has been able to foretell the result of the last 250 smallpox vaccinations. He outlines the technic. The skin site is cleansed with acetone and then with 95 per cent alcohol. After the skin is dry the virus is dropped onto the skin, which is held firmly and tensely between the thumb and the index finger. Thirty multiple pressure movements are then made through the drop of virus. The drop is allowed to remain four minutes before being wiped off with a cotton sponge containing a small amount of 50 per cent alcohol. The prognostic sign, a raised urticaria-like wheal of pseudopods, not always with an erythema base, becomes evident at this time. Often it is larger than the area traumatized. Whenever this wheal was seen, the child later showed a positive take. Pirquet observed this sign but not to prognosticate a take. The prominence of the wheal depends on the sensitiveness of the skin.

Medical Annals of District of Columbia, Washington

9:1-36 (Jan.) 1940

- Use of Intravenous Basergin in the Third Stage of Labor. E. J. Davin and T. N. Morris, New York.—p. 1.
Hearing Tests in Infancy and Early Childhood. W. A. Wells, Washington.—p. 8.
Diagnostic Study of the Patient with Coronary Artery Disease. G. L. Weller Jr., Washington.—p. 13.
Spontaneous Rupture of Urinary Bladder: Report of Case. P. C. Kiernan, Washington.—p. 18.

Michigan State Medical Society Journal, Lansing

39:1-76 (Jan.) 1940

- Democracy at the Crossroads. E. J. McCormick, Toledo, Ohio.—p. 17.
The Electrocardiograph: Its Clinical Value in the Small Hospital. W. M. Bartlett, Benton Harbor.—p. 22.
Adolescence. B. I. Beverly, Chicago.—p. 23.
The "Head Cold" in Infancy and Childhood—A New Method of Treatment. M. O. Cantor and H. S. Berman, Detroit.—p. 33.
Neuritis: Some Observations. H. W. Woltman, Rochester, Minn.—p. 34.
Strabismus in Children. J. W. White, New York.—p. 40.
Obstetric Stethoscope. R. Monfort, Onaway.—p. 41.
Carcinoma of Cervix: Its Management. A. H. Curtis, Chicago.—p. 42.

Minnesota Medicine, St. Paul

23:1-72 (Jan.) 1940

- Care of Automobile Injuries Involving the Face. G. B. New and J. B. Erich, Rochester.—p. 1.
Eye Injuries Due to Mechanical Causes. D. L. Tilderquist, Duluth.—p. 8.
Dysphagia. N. L. Leven, St. Paul.—p. 13.
Treatment of Atopic Dermatitis. E. M. Rusten, Minneapolis.—p. 16.
Symptom of Headache and Some Conditions Suggested by It. H. W. Woltman, Rochester.—p. 19.
Some Clinical Vagaries Associated with Bacterial Endocarditis. A. Hoff, St. Paul.—p. 25.
Fundamental Concepts of Medical Bibliography. T. E. Keys, Rochester.—p. 34.
Cystography in Study of Difficulties Following Prostatic Surgery. T. H. Sweetser, Minneapolis.—p. 40.

Nebraska State Medical Journal, Lincoln

25:41-80 (Feb.) 1940

- Allergy of Nose and Paranasal Sinuses: Principles of Diagnosis and Treatment. F. K. Hansel, St. Louis.—p. 41.
Intratemporal Repair of Facial Nerve for Facial Paralysis. W. A. Cassidy, Omaha.—p. 47.
Rheumatic Heart Disease. M. C. Howard, Omaha.—p. 51.
Id. O. V. Calhoun, Lincoln.—p. 56.
Treatment of Rheumatic Heart Disease. E. Thompson, Omaha.—p. 58.
Present Status of Hypertension. A. D. Cloyd, Omaha.—p. 60.
Acute Gastric Dilatation. W. F. Bowers, Omaha.—p. 64.

New England Journal of Medicine, Boston

222:79-124 (Jan. 18) 1940

- *Treatment of Pilonidal Sinus in Hospital Practice. H. Rogers, Boston.—p. 79.
President's Address. C. O. Coburn, Manchester, N. H.—p. 83.
Therapeutic Limitations of Female Sex Hormones in Gynecologic Conditions. G. V. Smith, Brooklyn, Mass.—p. 88.
Uremia Following X-Ray Therapy in Leukemia. D. Merrill, Cambridge, Mass.—p. 94.
Massachusetts Medical Society and Bristol South District Medical Society. P. E. Truesdale, Fall River, Mass.—p. 98.
Bacterial Infections of Gastrointestinal Tract. C. S. Keefer, Boston.—p. 105.

Treatment of Pilonidal Sinus.—Rogers says that at the Massachusetts General Hospital the failures in the treatment of pilonidal sinus have been reduced from about about 30 per cent to around 3 per cent since 1932, when a special study of this disease was undertaken. Analysis showed that 30 per cent of 119 patients treated during the eight preceding years had not been cured of their disease. Investigations led to the conclusion that large radical excisions are unnecessary and that the problem is chiefly one of wound healing in the presence of infection. In 1935 the conservative excision of pilonidal sinuses was begun in the outpatient department. The tissues were locally infiltrated with procaine hydrochloride containing epinephrine, and the sinus tract and hair nest were dissected out through a midline skin incision in a nearly bloodless field by means of a small cautery blade. The resultant narrow wound was then packed with gauze and the patient was allowed to go home. In most cases this proved to be a minor procedure requiring from twenty to thirty minutes and causing the patient no more reaction than does the excision of a wen. It was soon discovered, however, that the occasional patient with a lesion complicated by extensive scarring was best managed in the hospital under a general anesthetic. Of the 150 cautery excisions done between 1935 and

1937, fourteen were done in the hospital and 136 in the outpatient department. All the wounds were left open because the natural way for infected wounds to heal is by second intention. The patients returned Mondays and Thursdays to have their dressings done by the surgeon who operated on them. Except for certain cases of definitely delayed healing, the average time was about nine weeks. The wounds healed to a soft, inconspicuous linear scar. The fact that 97 per cent of these patients were cured by a conservative excision and have stayed cured for from one to four years convinces the author that most failures are not due to incomplete excision of diseased tissue but to faulty wound healing caused by infection and retained dead space, that there is no practical or theoretical justification for the radical excision of large blocks of normal skin and subcutaneous tissue, and that in unselected cases the highest percentage of cures can be obtained by conservative excision of the sinus tract and hair nest under direct vision, followed by solid second intention healing of the open wound, with the patient ambulatory and under the care of the same surgeon from first to last.

New Orleans Medical and Surgical Journal

92:349-412 (Jan.) 1940

- *Relation of Histaminase to Intestinal Toxemia and Asthma: Preliminary Report. A. Eustis, New Orleans.—p. 349.
Physiotherapy in Simple Fractures Intersecting Joints. G. A. Caldwell, New Orleans.—p. 352.
More Common Fractures of Bones of Hand. A. A. Tisdale, Lafayette, La.—p. 356.
Acute Perforated Gastric and Duodenal Ulcer. C. B. Odom and M. DeBaKey, New Orleans.—p. 359.
Peptic Ulcers in the Negro. M. Campagna, New Orleans.—p. 366.
Differential Diagnosis of Essential (Primary Arterial) and Secondary Hypertension. M. W. Matthews, Shreveport, La.—p. 368.
Concepts of Treatment of Hypertension. I. L. Robbins, New Orleans.—p. 375.
Technical and Practical Aspects of Milk Control. P. S. Parrino, Franklin, La.—p. 381.
Milk in Its Relation to Public Health. R. A. Strong, New Orleans.—p. 388.

Histaminase and Asthma.—Eustis reports four cases of allergic asthma successfully treated with histaminase. The product deteriorates rapidly and should be kept in a refrigerator. To overcome the effects of histamine in the intestinal canal, large doses of histaminase may be given at the start. By limiting the amount of ingested histidine, relatively small doses of histaminase are required. Until the specific foodstuff allergen is identified and desensitization carried out, histaminase may possibly control the attacks.

New York State Journal of Medicine, New York

40:77-152 (Jan. 15) 1940

- *Sulfapyridine Urolithiasis. M. R. Keen, Huntington.—p. 83.
Studies in Growth and Development of Children. H. Bakwin and Ruth Morris Bakwin, New York.—p. 88.
Roentgen Ray Therapy of Acute Mastitis During Lactation. Harriet C. McIntosh, New York.—p. 92.
Psoriasis—What to Do About It. H. H. Bauckus, Buffalo, and A. V. Kwak, Depew.—p. 96.
Teaching and Practice of Neurology and Psychiatry in the Outpatient Department. N. R. Chambers, Syracuse.—p. 101.
X-Ray Treatment of Inflammatory Conditions. J. R. Carty, New York.—p. 106.
Fractures in Rural Communities. M. H. Atkinson, Catskill.—p. 110.
Statistical Review of Eclampsia: Based on Twelve Years' Experience in Israel Zion Hospital. F. Weintraub, Brooklyn.—p. 112.
Value of Blood Sedimentation Rate in Intracranial Tumors. W. O. Klingman, R. W. Laidlaw and H. Spotnitz, New York.—p. 117.
Further Observations in Sulfanilamide Therapy of Gonococcal Infections. C. J. Van Slyke and J. F. Mahoney, Staten Island.—p. 122.

Sulfapyridine Urolithiasis.—Keen cites two cases of acute renal obstruction following the ingestion of sulfapyridine in amounts varying from 9 to 24 Gm. Crystals simulating sulfapyridine were found. Red blood cells and casts were present in the urine from the affected kidneys. The disorder of one patient subsided spontaneously following catheter drainage and increased fluid intake. The other patient has had several recurrent attacks of right lumbar pain. A recheck intravenous pyelography showed a small defect in the right renal pelvis (residual clot?). At no time did the urinary output diminish to an alarming degree. Unfortunately, blood nitrogen studies were not done. A moderate leukocytosis with a polymorphonuclear increase was observed. The factors in the production of sulfapyridine calculi may be (1) the marked dehydration of a toxic pneumonia patient and (2) the proved limited solubility of sulfapyridine (1:1,000)

at room temperature and the even greater insolubility of the acetylated derivatives. The possibilities of future urologic complications (nucleus of permanent stone formation and ureteral wall damage) are stressed.

North Carolina Medical Journal, Winston-Salem

- 1:1-64 (Jan.) 1940
 The Doctor and Socialized Medicine. J. B. Sidbury, Wilmington.—p. 1.
 Lewis Burgin McBrayer and the State Sanatorium. C. H. Cocke, Asheville.—p. 8.
 Pneumoconiosis. D. M. Brunfiet, Saranac Lake, N. Y.—p. 13.
 Various Forms of Encephalitis. B. J. Alpers, Philadelphia.—p. 18.
 Coordination of Public Health and Related Agencies. C. V. Reynolds, Raleigh.—p. 24.
 Recent Studies in Care of Late Gestational Toxemias. B. Harden, Burlington.—p. 27.
 New Urologic Procedures of General Surgical Interest. H. W. McKay, Charlotte.—p. 29.
 Clinical Experience with Sulfapyridine. W. A. MacColl, Durham.—p. 32.
 Some Problems of Diphtheria Control. J. C. Knox, Raleigh.—p. 37.
 Electrocardiogram as Aid in Cardiac Diagnosis. J. H. McNeill, North Wilkesboro.—p. 39.

Care of Late Gestational Toxemias.—Harden believes that protein dissipation bringing about a marked nitrogen deficit plays an important part in the early and late toxemias of pregnancy. He instituted a regimen to control this deficit. Patients were required to have at least eight hours of rest each day, foci of infection were eliminated whenever possible, fecal elimination was secured by the use of milk of magnesia or soapsuds enemas, and each patient was given a sufficient caloric intake to satisfy her basal needs plus the requirements of the infant. During seven years, 704 patients with late gestational toxemias were admitted to the hospital and convulsive seizures did not develop in any patient under this regimen, yet the number of eclamptic patients referred to the hospital in convulsions maintained the same incidence in the community as that previous to the adoption of this regimen.

Oklahoma State Medical Assn. Journal, McAlester

- 33:1-52 (Jan.) 1940
 Primary Panniculitis Afebrile in Type and Associated with Scleroderma-like Changes. O. G. Hazel and J. Lamb, Oklahoma City.—p. 1.
 Consideration of Certain Fractures of Elbow. D. H. O'Donoghue, Oklahoma City.—p. 5.
 Primary Glaucoma. E. D. McKay, Oklahoma City.—p. 8.
 Nasal Plastic Operations. M. C. England, Woodward.—p. 10.
 Lymphopathia Venerea. J. Fulcher, Tulsa.—p. 12.
 Use of Antiseptic Anesthetic Agent Locally in Extensive Burn. P. Nagle, Oklahoma City.—p. 14.

Antiseptic Agent Used Locally for Burns.

—Nagle reports the management of a major burn with an antiseptic bacteriostatic topical dressing. The burn resulted from gasoline slopped over the left trouser leg. This leg was severely burned and both hands were burned in the patient's effort to put out the fire. The patient was seen four days later, at which time the examination revealed second and third degree burns of the entire circumference of the left leg from the ankle to the mid-thigh, blistering burns of the right hand and blistering and full thickness "cooking" burns of the left palm and wrist. The full thickness destruction were beginning to devitalize and pus was apparent. Adequate dressing of the leg was impossible because of the patient's refusal to tolerate pain. Annular gauze dressings saturated in an oil emulsion of vegetable oil emulsion (Foilie) and changed every four hours were instituted. The immediate response of the patient was gratifying. With each dressing, some of the free debris of the burn came away until only the devitalized but securely fixed skin required removal. At the time this anesthetic, bacteriostatic vegetable oil emulsion was first applied, infection was beginning. This was arrested in twenty-four hours. There was never an elevation of temperature. The patient was discharged in about ten weeks. Epithelialization progressed at a normal rate and the influence of this preparation on the growth and take of the cutaneous grafts was not unfavorable. The preparation contains 0.14 per cent of potassium iodide, 0.25 per cent of calcium iodide, 0.02 per cent of calcium thiosulfate, 0.39 per cent of calcium soap, 0.2 per cent of oxyphenolone base, 1.4 per cent of ethyl alcohol by volume, 28 per cent of phenol, 1.3 per cent of ethyl aminobenzoate and 60.11 per cent of vegetable oil as a vehicle.

Psychiatric Quarterly, Utica, N. Y.

- 14:1-228 (Jan.) 1940
 Freud—The Man (Born in Freiberg, Moravia, May 6, 1856. Died Sept. 23, 1939, in London, England). C. P. McCord, Albany, N. Y.—p. 3.
 Sexual Manifestations in Neurotic and Psychotic Symptoms. A. A. Brill, New York.—p. 9.
 Clinicopathologic Study of Case of Pick's Disease. A. Ferraro and G. A. Jervis, New York.—p. 17.
 Suicide as Wish Fulfillment. I. Hendrick, Boston.—p. 30.
 Effect of Metrazol Injections on Electro-Encephalogram. H. Strauss and W. E. Rahm Jr., New York.—p. 43.
 Psychopathic States with Psychotic Reactions. J. L. Nelson and J. Zimmerman, Brooklyn.—p. 49.
 Six Cases of Psychosis Associated with Illuminating Gas Poisoning. Brief Review of Literature. A. G. Rodgers Jr., Central Islip, N. Y.—p. 61.
 Combined Insulin and Metrazol in Treatment of Psychoses. S. J. Tillim, Amityville, N. Y.—p. 81.
 Prepsychotic Personality in Alcoholic Psychoses. E. Davidoff and C. A. Whitaker, Syracuse, N. Y.—p. 103.
 Aggravation of Mental Symptoms by Excessive Use of Hypnotics and Sedatives. L. S. Wondolowski, Middletown, N. Y.—p. 121.
 Injuries Sustained During Course of Metrazol Shock Therapy. C. C. Graves and F. P. Pignataro, Marlboro, N. J.—p. 128.
 Malaria Therapy for the Nonhospitalized Case of Neurosyphilis (Malaria Therapy in the Community). W. A. Thompson, Orangeburg, N. Y.—p. 135.
 Schizophrenic "Deterioration." S. R. Lehrman, Utica, N. Y.—p. 140.
 Folliculin Menformon (Theelin) Treatment of Involuntional Melancholia. J. Notkin, B. Dennes and V. Huddart, Poughkeepsie, N. Y.—p. 157.
 Involuntional Melancholia: Study of Syndrome and Report on Use of Estrogen. C. L. Wittson, Central Islip, N. Y.—p. 167.
 Five Years Work with Cerebral Palsy: Critical Analysis. J. Sirkin, Newark, N. Y.—p. 185.
 Acute Heterosexual Inadequacy: II. In the Female. Jane E. Oltman, Niantic, Conn., and S. Friedman, Newtown, Conn.—p. 194.

Public Health Reports, Washington, D. C.

- 55:1-40 (Jan. 5) 1940
 Disabling Morbidity Among Industrial Workers, Third Quarter and the First Nine Months of 1939. W. M. Gaffner.—p. 1.
 Mortality Rates and Economic Status in Rural Areas. H. F. Dorn.—p. 3.
 Effect of Sulfapyridine and Sulfanilamide With and Without Serum in Experimental Meningococcal Infection. Sarah E. Branham.—p. 12.
 Rocky Mountain Spotted Fever: Treatment of Infected Laboratory Animals with Immune Rabbit Serum. N. H. Topping.—p. 41.
 Cases and Days of Illness Among Males and Females, with Special Reference to Confinement to Bed: Based on 9,000 Families Visited Periodically for Twelve Months, 1928-1931. S. D. Collins.—p. 47.
 55:107-134 (Jan. 19) 1940
 Epidemic and Endemic Typhus: Protective Value for Guinea Pigs of Vaccines Prepared from Infected Tissues of Developing Chick Embryo. H. R. Cox and E. J. Bell.—p. 110.
 Pathology of Poliomyelitis Experimentally Induced in Eastern Cotton Rat, Sigmodon Hispidus Hispidus. R. D. Lillie and C. Armstrong.—p. 115.
 Anopheles Walkeri (Theobald): A Wild-Caught Specimen Harboring Malarial Plasmodia. F. B. Bang, G. E. Quinby and T. W. Simpson.—p. 119.
 55:135-186 (Jan. 26) 1940
 Disabling Diseases of Childhood: Their Characteristics and Medical Care as Observed in 500,000 Children in Eighty-Three Cities Canvassed in the National Health Survey, 1935-1936: I. Characteristics and Leading Causes. Dorothy F. Holland.—p. 135.
 Ocular Manifestations of Ariboflavinosis. H. D. Kruse, V. P. Sydenstricker, W. H. Schrell and H. M. Cleckley.—p. 157.
 Origin of Induced Pulmonary Tumors in Strain A Mice. H. G. Grady and H. L. Stewart.—p. 169.

Ocular Manifestations of Ariboflavinosis.

—Kruse and his associates describe the ocular changes of nine patients known to be receiving insufficient riboflavin. Beneficial effects followed the principal manifestation was found to be a keratitis. The corneal lesions improved or disappeared on riboflavin therapy and recurred when treatment was discontinued. Two cases of keratitis associated with syphilis but resistant to antisyphilitic treatment were studied without any attempt being made to control the diet. Riboflavin therapy appeared to be distinctly beneficial in these cases. When first seen only four of the nine patients were free from other deficiency disease. Six patients were hospitalized and three were treated as outpatients. All had ocular changes in addition to the keratitis, for which there were symptoms and signs. Itching, burning and a sensation of roughness of the eyes with mild photophobia were rather common complaints; severe photophobia, dimness of vision in poor light and partial blindness were complained of less frequently. Corneal opacities of five patients were grossly visible. Five patients showed congestion of the bulbar conjunctiva with marked circumcorneal injection. Associated with the bulbar

congestion was injection of the fornix conjunctivae. Most of the patients showed impaired visual acuity by test. No definite abnormalities in the fundi were seen on ophthalmoscopic examination. The keratitis occurred with other signs of ariboflavinosis: cheilosis, glossitis and seborrheic dermatitis. It corresponded with them in progression or regression, according to discontinuance or administration, respectively, of riboflavin. The rapid and almost complete response of the keratitis associated with syphilis to riboflavin therapy of the two patients suggests that there may be a riboflavin involvement.

Radiology, Syracuse, N. Y.

34:1-130 (Jan.) 1940

- Cancer of Stomach (Carman Lecture). W. C. MacCarty Sr., Rochester, Minn.—p. 1.
- Physical Factors Influencing Difference Between 200 and 500 Kilovolt Radiation. K. E. Corrigan, Detroit.—p. 8.
- Differences Between 200 Kilovolt and Supervoltage Roentgen Therapy. R. Dresser, J. C. Rude and B. J. Cosman, Boston.—p. 13.
- Biologic Measurement of High Voltage Radiations. C. Packard, New York.—p. 17.
- Late Sequelae of Divergent Biologic Skin Effects Produced by Roentgen Irradiation with Varying Voltages. E. R. Witwer and T. Leucutia, Detroit.—p. 24.
- Clinical Aspects of Supervoltage Roentgen Therapy in Cancer. W. E. Costlow, Los Angeles.—p. 28.
- Reaction of Carcinomas of Cervix to Known Doses of 800 Kilovolt Roentgen Rays, Five Year, Four Year and Three Year Survival Rates. H. Schmitz, Chicago.—p. 34.
- *Roentgen Ray Treatment of Hyperthyroidism. G. E. Pfahler, Philadelphia.—p. 43.
- Chronic Gastric Volvulus. A. C. Singleton, Toronto.—p. 53.
- Miniature Films in Chest Surveys. H. E. Potter, Chicago.—p. 62.
- Pericolic Membranes. W. R. Cashion, Brooklyn.—p. 66.
- Pathogenesis and Radium Therapy of Mixed Tumors of Salivary Glands: Illustrative Cases. I. Levin, New York.—p. 69.
- Contributory Negligence as It Applies to Medical Malpractice. I. S. Trostler, Chicago.—p. 76.
- First Measurements with Spanish Standard for Absolute Determination of International Roentgen Unit. H. T. Plasencia.—p. 82.

Roentgen Treatment of Hyperthyroidism.—Pfahler believes that irradiation is indicated in all cases of hyperthyroidism in which the patient is not in crisis or is not suffering from definite pressure symptoms. On the other hand, operation should be recommended in all simple or nontoxic goiters unless there is some contraindication, in which case a moderate amount of irradiation may be used. Sometimes brilliant results are obtained, even when large goiters of this type are present. With irradiation the fear of operation is eliminated and the patient is more likely to come under treatment early before cardiac damage has taken place. There is no pain or shock and no great inconvenience. Patients with advanced disease or serious cardiac complications may be treated without shock. There is no risk of mortality from the treatment. The end results are about equal to those obtained by surgery. The objections to irradiation that must be considered are the danger of burns, telangiectasis and skin atrophy, exacerbation of symptoms, myxedema, difficulty in subsequent surgical treatment, slowness of response to irradiation and the possibility of permanent cardiac impairment developing during the period of prolonged irradiation.

Review of Gastroenterology, New York

7:1-102 (Jan.-Feb.) 1940

- Three Clinical Signs Useful in Diagnosis of Chronic Amebic Colitis with No Dysenteric Symptoms. A. Castellani, New Orleans.—p. 1.
- Immunity in Hookworm Disease. W. W. Cort and G. F. Otto, Baltimore.—p. 2.
- Relationship of Bacillary Dysentery Infections to Chronic Intermittent Diarrheas. R. Turell, Brooklyn.—p. 14.
- Relation Between Peptic Ulcer and Cancer of Stomach from the Genetic Point of View. J. Bauer, New Orleans.—p. 21.
- Critical Evaluation of Parenteral Treatment in Peptic Ulcer. E. Granet, New York.—p. 25.
- Fragmentation of Duodenal Bulb: Roentgen Sign of Duodenal Ulcer. M. Feldman, Baltimore.—p. 35.
- Effects of Hydrogels on Configuration and Functions of Colon: Preliminary Study. D. Stein and J. Gelehrter, Philadelphia.—p. 39.
- Hernia in Its Relation to Gastrointestinal Symptoms. A. R. Koontz, Baltimore.—p. 47.
- Evaluation of Liver Function Tests. F. W. Konzelmann, Philadelphia.—p. 51.
- Some Gallbladder Problems in Relation to Dyspepsia. E. H. Hutchins, Baltimore.—p. 59.
- Critique on Duodenobiliary Drainage. N. W. Elton, Buffalo.—p. 65.
- Reflections on Surgery of Gallbladder and Biliary Tract. I. Cohn, New Orleans.—p. 71.
- Eppinger's Liver Diseases: Review. W. Rado, Newark, N. J.—p. 79.

Southern Surgeon, Atlanta, Ga.

9:1-74 (Jan.) 1940

- Some Cardiovascular Problems of Interest to Surgeons. H. Roesler, Philadelphia.—p. 1.
- Infections of Hand. D. L. Maguire, Charleston, S. C.—p. 11.
- Cinefluorography. W. H. Stewart and F. H. Ghiselin, New York.—p. 21.
- Bursitis About the Shoulder. A. H. Weiland and C. R. Burbacher, Coral Gables, Fla.—p. 26.
- Rehabilitation of the Physically Handicapped. H. H. Kessler, Newark, N. J.—p. 34.
- Hyperparathyroidism: Report of Nine Cases. D. Hart and C. E. Gardner Jr., Durham, N. C.—p. 41.
- Review of Hirschsprung's Disease: Report of Case Treated by Presacral Sympathectomy. J. D. Hancock, Louisville, Ky.—p. 59.

Surgery, St. Louis

7:1-166 (Jan.) 1940

- Technic for Splanchnic Resection for Hypertension: Preliminary Report. R. H. Smithwick, Boston.—p. 1.
- The Silk Technic: Experimental Observations. P. Shambaugh, Chicago.—p. 9.
- *Immediate Strength of Sutured Wound. E. L. Howes, Washington, D. C.—p. 24.
- Reaction of Experimental Sarcomas to Wound Healing Stimulus. O. C. Julian and A. Brunschwig, Chicago.—p. 32.
- Experimental Study of Bacteriology of Perforation Peritonitis. Cora Rust Owen, Minneapolis.—p. 37.
- *Trauma and Appendicitis. J. E. A. Connell, Denver.—p. 47.
- *Fever Therapy in Treatment of Mechanical Intestinal Obstruction Due to Pelvic Inflammatory Disease: Report of Two Cases. B. A. Smith Jr., Minneapolis.—p. 61.
- Anorectal Complications of Chronic Ulcerative Colitis, with Several Illustrative Cases. N. D. Smith and R. J. Jackman, Rochester, Minn.—p. 69.
- Vasomotor Action of Epinephrine on Digital Arterioles of Man Before and After Sympathectomy. T. J. Fatherree, A. W. Adson and E. V. Allen, Rochester, Minn.—p. 75.
- Consideration of Value and Indications for Encephaloventriculography, with Especial Reference to Its Use in Borderline Neurosurgical Conditions. J. M. Meredith, University, Va.—p. 95.
- Postoperative Myxedema. W. D. Wilson and C. W. Mayo, Rochester, Minn.—p. 117.
- Mixed Tumor (Carcinosarcoma) of Breast. S. W. Harrington and J. M. Miller, Rochester, Minn.—p. 122.
- Fibrosarcoma of Mammary Gland. S. W. Harrington and J. M. Miller, Rochester, Minn.—p. 129.
- Painful Divided Navicular of Foot: Its Diagnosis and Treatment. J. A. Schindler and W. B. Gnagi Jr., Monroe, Wis.—p. 133.

Immediate Strength of Sutured Wound.—Howes discusses the degree of strength which can be given to the repair of a wound by means of sutures. The common belief is that the strength of the sutured wound is dependent on the strength of the sutures. Actually, the number of sutures is a contributing factor but the holding power of the tissue really determines the strength of the union, and the strength of the sutures in the wound is much less than generally supposed. As far as strength is concerned there is no need of suturing any other tissue but fascia, except to eliminate dead space or to prevent herniation of the peritoneum. When multiple sutures are used there is no need to use a suture with a functional strength stronger than No. 0 catgut, because the holding power strengths of all tissues are less and really limit the strength of the repair. The use of any larger suture simply provides an excess amount of foreign material without greater strength and presents the possibility of untoward wound healing. Increasing the number of sutures increases the amount of holding power of the tissues but, more important still, increases in direct proportion the functioning strength of the sutures, providing a better ratio of functioning strength of holding power. Therefore less strain is thrown on each suture. Increasing the bite of tissue enhances holding power to a slight degree, but only in fascia. The danger of tissue necrosis is so great with the use of the deep-bite suture that it should be used sparingly, and better healing is usually obtained when it is not used. Interrupted sutures are recommended because the strength of each unit is preserved when the suture material is being absorbed or the holding power is lost in one portion of a wound and not because they give greater strength than the continuous suture. Under similar conditions the integrity of continuous suture would be entirely lost.

Trauma and Appendicitis.—Data in response to a questionnaire on the incidence of trauma (external violence or muscular strain) in appendicitis in the experience of eighty-one surgeons operating in 72,803 cases of acute appendicitis are presented by Connell. All these surgeons agree that trauma as an etiologic

CURRENT MEDICAL LITERATURE

FOREIGN

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An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:1-40 (Jan. 6) 1940

- Pulmonary Circulation—Before and After Harvey. R. A. Young. p. 1.
Bacterial Endocarditis: Possibility of Cure by Sulfonamides: Report Case. C. T. Andrews.—p. 5.
Nocturnal Enuresis. Doris M. Odum.—p. 8.
*Treatment of Mental Disorders with Male Sex Hormone. A. Guiridham.—p. 10.
Surgical Treatment of Trigeminal Neuralgia. G. F. Rowbotham.—p. 12.

Treatment of Mental Disorders with Androgen.—Guiridham used testosterone propionate and androsterone benzoate for the treatment of four mentally disordered male patients. With one partial exception, there was no hypogonadism present. In case 1 the first beneficial mental effects from the treatment embodied a rapid transition from a psychotic to a psychoneurotic state. Acute anxiety and obsessive tendencies were dispelled. Patient 2 improved far beyond expectations. In addition to profound obsessional tendencies and early signs of schizophrenia there were such legal complications as thefts. In the third case anything other than the most inconsiderable alleviation of symptoms could not be expected, as the patient was a grossly arteriosclerotic man aged 74 with melancholia and delusions of visceral function and financial ruin. Patient 4 was profoundly hypochondriacal before treatment was initiated. The prognosis in two of these cases was considered hopeless. Conditions of undoubted gravity have been remedied. Treatment with sex hormones is a rational procedure in postclimacteric conditions. The author believes that the form of psychoneurotic symptoms is largely determined by the degree of stability shown by the vegetative nervous system, and this in its turn is dependent on glandular activity.

Clinical Science, London

4:103-216 (Dec.) 1939

- Observations on Oxygen Content of Venous Blood from Arm Vein and on Oxygen Consumption of Resting Human Muscle. H. E. Holling.—p. 103.
Cure of Experimental Renal Hypertension. S. Cerqua and A. Saman.—p. 113.
*Insulin-Sensitive and Insulin-Insensitive Types of Diabetes Mellitus. H. P. Himsworth and R. B. Kerr.—p. 119.
*Age and Insulin Sensitivity. H. P. Himsworth and R. B. Kerr.—p. 153.
Fiber Dissociation Produced by Cooling Human Nerves. R. G. Bickford.—p. 159.
Rapid Method of Determining Lung Capacity. J. McMichael.—p. 167.
Postural Changes in Lung Volume. J. McMichael and J. P. McG.—p. 175.
Effect of Estrogens on Urinary Creatinine of Castrate and Menopausal Women. E. P. Sharpey-Schafer and I. Schrire.—p. 185.
Some Painful Joint Conditions and Their Relation to Osteoarthritis. J. H. Kellgren.—p. 193.
Hypertension Produced in Rabbit by Prolonged Renin Infusion. Janet Hill and G. W. Pickering.—p. 267.

Insulin Sensitivity and Diabetes Mellitus.—Himsworth and Kerr state that under standard conditions of diet and environment diabetic patients react in one of two ways to the insulin-dextrose test and by means of the test diabetes may be divided into two distinct types: the insulin sensitive and the insulin insensitive. The two types of diabetes can be differentiated on the basis of the speed with which they react to insulin. In the insulin sensitive type insulin comes into action rapidly. Insulin sensitive diabetic patients react favorably to increase of dietary carbohydrate. In the insulin insensitive diabetic patient increase of dietary carbohydrate causes increase in glycosuria, a tendency to higher fasting blood sugar levels, impairment of sugar tolerance and little or possibly no increase in sensitivity to insulin. Corresponding to the two types of diabetes, differentiated by the insulin dextrose test, two clinical groups of patients can be distinguished. The insulin sensitive diabetic patients tend to be younger, to be thin and to have a normal blood pressure and healthy arteries. In them the disease is sudden and severe at onset. In them ketosis develops easily and they react to a slight excess of insulin with a hypoglycemic attack. The insulin insensitive diabetic patients tend to be older, to be obese,

factor is rare. Thirty-one feel that it is possible for trauma to cause appendicitis, six that a previously diseased appendix might be aggravated by trauma but that appendicitis cannot be initiated by an injury, and eleven that a strain can play a part in the etiology of appendicitis; twenty-four saw cases in which they believed trauma entered into the etiology. Questionnaires from thirty hospitals reporting 49,604 cases of acute appendicitis gave a history of trauma in only eleven cases. The author cannot accept the theory that trauma forces cecal contents into the appendix or forces fecaliths farther into the appendical lumen. If this were a fact, many more cases of acute appendicitis would be encountered following the numerous automobile accidents seen today. He can conceive of an appendix being traumatized by a direct blow if it lies over the brim of the pelvis, or it could possibly be bruised if close to the anterior abdominal wall in an extremely thin individual; but in such instances there would be other evidence of trauma.

Fever Therapy for Intestinal Obstruction Due to Pelvic Disease.—Smith reports two cases of mechanical obstruction of the small intestine, secondary to gonorrheal adnexitis, treated by hyperthermia. The hyperpyrexia must be carefully supervised. The treatment is delayed, if possible, until a positive or stationary weight balance is maintained, until balance during artificial fever in the presence of intestinal obstruction and must be checked frequently. A "wet" chamber is used to produce and maintain fever, as fluid and chloride losses by perspiration are less and hyperventilation is less marked than when a "dry" chamber is used. From reported cases the impression is gained that most mechanical intestinal obstruction in gonorrheal adnexitis is caused by agglutination of intestinal loops to the inflammatory mass; it is probable that this is true in most of the cases resistant to the usual conservative regimen.

Tennessee State Medical Assn. Journal, Nashville

33:1-38 (Jan.) 1940

- Brain Tumors in Childhood. C. Pilcher, Nashville.—p. 1.
Brain Abscess and Meningitis Caused by Type III Pneumococci—Cure with Sulfapyridine. T. F. Frist and E. Rippey, Nashville.—p. 8.
Brucellosis: Report of Cases. W. R. Blue, Memphis.—p. 9.

West Virginia Medical Journal, Charleston

36:1-48 (Jan.) 1940

- One-Stage Combined Abdominoperineal Resection for Carcinoma of Rectum, Rectosigmoid and Sigmoid. C. W. Mayo, Rochester, Minn.—p. 1.
*Treatment of Sinusitis in Children. E. C. Mitchell, Memphis, Tenn.—p. 8.
Home Obstetrics. H. E. Beard, Huntington.—p. 18.
Value of Determination of Muscle Imbalance in Refraction. C. T. St. Clair Jr., Bluefield.—p. 22.
Rocky Mountain Spotted Fever: Report of Two Fatal Cases. J. S. Pearson, Huntington.—p. 26.
Diagnostic Problems. J. D. Romino, Fairmont.—p. 28.

Treatment of Sinusitis in Children.—Mitchell declares that development and growth of the sinuses depend on the establishment of proper pneumatization. An individual with normally developed sinuses may have attacks of acute sinusitis; chronic sinusitis, however, is associated with deficient development. The undeveloped sinus is usually diseased. When the tonsils are removed early in life, additional work is thrown on the sinuses, which play an intimate part in immunization against diseases that may arise from infections of the upper part of the respiratory tract. Kaiser, on examination of school children with and without tonsils, found sinus infection more prevalent in those whose tonsils had been removed during their early years. In some cases of sinusitis, extension of the infectious process is apparent in the chest; in fact, this observation may be so pronounced as to lead one to suspect tuberculosis. In addition to general physical studies, every patient with sinusitis should have an allergic study. In allergic sinusitis, the mucous membrane of the posterior nares is pale and the secretion is fluid. In chronic sinusitis from infection, the mucous membrane of the ring, is boggy and red and secretes a thick mucus. Further, there is generally a fluid level, especially if the antrums are the foci of infection. Frequently, both infection and allergy play a part.

to have hypertension and to exhibit arteriosclerosis. The onset of the disease in them is insidious. In them ketosis develops rarely and they can tolerate an overdose of insulin without showing symptoms of hypoglycemia.

Age and Insulin Sensitivity.—Himsworth and Kerr present evidence that in healthy subjects insulin sensitivity varies with age. Thirteen subjects were investigated, two women and eleven men. Their ages varied from 18 to 64 years. Nine of the subjects were healthy. All received a diet of 1,750 calories, containing 175 Gm. of carbohydrate, for at least one week before the dextrose tolerance and insulin-dextrose tests were performed. The standard dose of dextrose given by mouth in both tests was 30 Gm. per square meter of body surface; the standard dose of insulin injected intravenously in the insulin-dextrose test was 5 units per square meter of body surface. Both tests were terminated after one hour. As age increases the dextrose tolerance area tends to increase; that is, dextrose tolerance diminishes. Parallel with this tendency to diminution of dextrose tolerance there is a tendency to diminution of insulin sensitivity as shown by a diminishing insulin-dextrose ratio. In healthy subjects less than 40 years of age the insulin-dextrose ratio, when taking a diet containing 175 Gm. of carbohydrate, averages 1.01 and in those more than 40 years of age it averages 0.78; in insulin-sensitive diabetic patients less than 40 years of age it averages 1.44 and in those more than 40 years of age it averages 1.18; in insulin-insensitive diabetic patients less than 40 years of age the figure is 0.56 and in those more than 40 years of age it is 0.49. Thus in both types of diabetic patients and in normal subjects sensitivity to insulin tends to decrease as age advances. The older healthy subjects with impaired insulin sensitivity are regarded as potentially diabetic, that is of the insulin-insensitive type, and their impaired sensitivity to insulin is regarded as an abnormality which is not sufficiently advanced to be incompatible with health.

Edinburgh Medical Journal

47:1-80 (Jan.) 1940

- Dysmenorrhea. R. W. Johnstone.—p. 1.
Psychosomatic Medicine. R. G. Gordon.—p. 16.
Physical Education in the University of Edinburgh. J. K. Slater.—p. 32.
*Observations on Treatment of Severe Hematemesis and Melena. L. D. W. Scott.—p. 49.
*Manifestations of Tuberculosis in Ophthalmic Practice. H. M. Traquair.—p. 57.

Treatment of Severe Hematemesis and Melena.—For the treatment of sixty cases of severe hematemesis and melena Scott used the Witts modification (fluid feeding for the first forty-eight hours) of Meulengracht's technic of immediate feeding. The patients were suffering from peptic ulceration on admission. They included all those who were admitted with severe bleeding from the upper part of the alimentary tract with or without a previous history of dyspepsia but with no clinical evidence of malignant disease or any extra-alimentary lesion which might have been the cause of the hemorrhage. This excluded patients with ascites, jaundice, hepatic enlargement or signs of hemorrhagic disorder of the blood. Three of the selected patients died as the result of hemorrhage, giving a mortality of 5 per cent and a corrected mortality of 3.3 per cent, as one of those who died was suffering from severe aortic regurgitation in addition to the gastrointestinal hemorrhage. This was regarded as a most satisfactory result. As there is no general agreement concerning the death rate from severe gastroduodenal bleeding, caution must be exercised in attributing the low mortality in the present series to the effect of the treatment used. For comparison, fifty patients with severe hematemesis were treated by the standard method of initial starvation. There were seven deaths in this group, a mortality of 14 per cent; one patient died within thirty minutes of admission to the hospital and therefore cannot be regarded as a death under treatment; therefore the corrected mortality is 12 per cent. The reduction in the death rate of patients receiving immediate feeding could not be attributed to the change in treatment alone, as this group contained a greater proportion of young persons. The extent of the lesion in fatal cases of severe hematemesis and melena makes it doubtful that treatment by immediate feeding can be of the greatest value in saving life. Low mortality figures published

in the literature are most probably due to a comparative absence of the most severe type of cases in the series examined. The author's experience with the method of immediate feeding confirms the observation that the method is not harmful and is preferable to treatment by preliminary starvation; but a study of the pathologic changes of fatal cases makes it unlikely that a striking reduction in the mortality can be secured by this means alone.

Ophthalmic Manifestations of Tuberculosis.—Traquair declares that apart from maldevelopments, injuries and external infections there are no diseases of the eye in the sense that the disease originates and is limited to the eye. Ocular lesions other than injuries, external infections and maldevelopments are manifestations in the eye of some general condition frequently based on an inadequate power of resistance, which, in its turn, is often the result of defective nutrition. Tuberculosis of the eye affects it in two ways: as an allergic response and as an actual infection by the tubercle bacilli. In the first the tissues of the eye can be sensitized as part of a general sensitization and also locally and may give a violent allergic response. In actual infection by tubercle bacilli, the bacilli usually enter the body by the alimentary or respiratory channels. Ocular tuberculosis usually occurs clinically as a blood infection in previously infected persons who are potentially allergic to tuberculo-protein. It is uncommon in patients with active and gross tuberculous foci, such as inmates of sanatoriums, but is typically found in patients who show apparently healed pulmonary tuberculosis and tuberculo-adenitis. Tubercle bacilli may be present in the blood in some cases. It is characteristic of all forms of tuberculosis in association with the eye that the patient does not present gross manifestations of an active tuberculous infection elsewhere. The patients frequently show little, if any, outward evidence of tuberculous infection but, on careful search, glands in the neck, roentgenograms indicative of affected glands in the hilus or mediastinum or x-ray signs in the lungs themselves may be found. The diagnosis is based on the careful examination of the eye, including the clinical picture as a whole. If cutaneous tests with old tuberculin are used, great care should be taken to avoid a local reaction. Treatment is both local and general. Local treatment consists of remedies applied directly by the ophthalmologist to relieve symptoms and local ocular complications. The only treatment of real importance is the general treatment, which is the treatment of tuberculosis. It is essential to recognize that the patients are primarily suffering from tuberculosis and secondarily from a disease of the eye. Tuberculin in carefully graduated doses is of some value and may be used in all cases except scrofulous ophthalmia.

Lancet, London

1:1-60 (Jan. 6) 1940

- Pulmonary Circulation Before and After Harvey. R. A. Young.—p. 1.
*Diseases of Right Middle Lobe of Lung. A. L. Punch.—p. 5.
Intubation of Small Intestine: Demonstration and Localization of Partially Obstructive Lesions. T. H. Boon.—p. 7.
*Vitamin E in Treatment of Muscular Dystrophies and Nervous Diseases. F. Bicknell.—p. 10.
Anemia of Pregnancy in India: Its Treatment with Cholesterol. Hermendra Nath Chatterjee.—p. 14.
Basal Metabolic Rate: Measurement of Production of Carbon Dioxide. A. E. B. Harding.—p. 17.
Streptococcal Infections in Mice Treated by Chemotherapy and Serum. L. Colebrook and W. R. Maxted.—p. 21.
Hodgkin's Disease. C. Baker and W. N. Mann.—p. 23.
Excretion of Sulfapyridine. G. V. James.—p. 25.
Suprarenal Cortical Extract in Acute Confusional States. H. Hoff and J. A. Shaby.—p. 27.
Coagulative Serum Prepared by Injecting Hirudin into Animals. O. Országh and J. Alföldy.—p. 28.

Diseases of Middle Lobe of Lung.—Punch shows that the more precise technic in radiography of the chest, including lateral and oblique views besides anteroposterior, together with the introduction of bronchography and tomography, has led to a greater degree of accuracy in the localization of pulmonary lesions. One of the many interesting facts that have emerged from these advances in diagnostic radiography is the frequency with which a variety of diseases can originate in and often be entirely confined to the middle lobe on the right side. The object of this communication is to describe instances of five different pathologic conditions affecting this region of the lung. Acute lobar pneumonia may originate in the right middle lobe and may

Archives des Maladies du Cœur, Paris

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remain confined to it or subsequently spread to other lobes. The author reports a case in which the disease started in the middle lobe and later involved the whole of the collapsed middle lobe. This case offers a good example of silent bronchiectasis; that is, bronchiectasis without sputum. This condition is easy to miss, for not only are there often no abnormal physical signs but also the straight roentgenogram may show little that is abnormal of the middle lobe. Most of the cases which the author has encountered have been detected by routine bronchograms taken in the investigation of cases of slight hemoptysis in which no evidence of tuberculosis could be found. The described case of massive collapse of the right middle lobe resulting from obstruction to the bronchus leading to it illustrates the extreme importance of bronchoscopy in all cases in which a bronchial carcinoma is suspected. The fourth case describes a case of interlobar effusion which demonstrates that a collection of fluid in the lesser fissure of the lung may cause an opacity in the region normally occupied by the right middle lobe. In the summary the author stresses that, owing to the anatomic position of the right middle lobe, especially when it is partially or completely collapsed, disease of it often produces few, if any, abnormal physical signs. The shadows produced in the straight roentgenograms, in both the anteroposterior and lateral views, by the pathologic conditions enumerated are often very similar in appearance. It is often only by further methods of examination, such as bronchography, bronchoscopy and exploratory puncture of the chest, that a differential diagnosis between them can be made.

Vitamin E in Muscular Dystrophies and Nervous Diseases.

Bicknell says that Einarson and Ringsted have suggested that the muscular dystrophies, amyotrophic lateral sclerosis and tabes dorsalis are due to a deficiency of vitamin E. Bicknell reviews experimental studies conducted by Ringsted, Einarson and others. It occurred to him that before beginning to use vitamin E for human diseases it is necessary to decide whether it could be insufficient in normal diets. Foods which should contain a small amount of vitamin E may well contain none by the time they are eaten. Moreover, of the foods which are rich in the vitamin, the most important, wheat germ, is to all intents and purposes never eaten. Green leaves, the other rich source of vitamin E, are eaten though never in large quantities by dried weight. It is not therefore unreasonable to consider that diets may in some cases be on the edge of a vitamin E deficiency: a deficiency which might become serious if for any reason absorption from the intestine was impaired or if the demands of the muscular and nervous systems were higher than normal, either from a hereditary disposition or from toxic influences, such as syphilis in tabes. Many obscure lesions of the muscular and nervous systems might be explained in this way. Tabes would be regarded as the result not of syphilis alone but also of a deficiency of vitamin E, causing degeneration of the tracts already weakened by syphilis. The muscular dystrophies and amyotrophic lateral sclerosis would be interpreted as the same deficiency disease having one form in children and another in adults. The author resorted to treatment with fresh dried whole wheat germ one half ounce twice daily in twenty-six cases: eighteen of muscular dystrophy, four of amyotrophic lateral sclerosis, two of tabes dorsalis, one of peroneal muscular atrophy and one of amyotonia congenita. In the group of the myopathies—chiefly children—the results of treatment with vitamin E were remarkable. Every patient except one improved who was treated for more than six weeks. Not enough patients with amyotrophic lateral sclerosis have been treated for the results to be definite, but on the whole the author thinks they are promising. The two cases of tabes were too advanced for muscular atrophy has not been treated long enough for any conclusions to be drawn. The small girl with amyotonia congenita appeared to have been greatly improved. It appears reasonable to suggest that in all degenerations of the muscular or nervous systems, such as disseminated sclerosis, a large supply of vitamin E should be of value.

Malignant Endocarditis of Right Heart. Dalous, Roques, J. Faure. H. Pons.—p. 945.
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Electrocardiogram in Progressive Muscular Dystrophy.

—Following a review of the literature on electrocardiographic studies in progressive muscular dystrophy, Puddu and Mussafia describe their studies in thirty-three cases. Twenty-nine presented the symptoms of the ordinary forms of progressive muscular dystrophy (Charcot-Marie). The disease was in different evolutive phases, from the most benign to the most grave. Only two of the thirty-three cases presented symptoms of cardiac disorders: an attack of tachycardia of a paroxysmal character occurred in one case and another one presented rheumatic cardiopathy with mitral stenosis. The authors made electrocardiographic records in all of the cases, often several times, with three peripheral and two thoracic leads. Summarizing the result of their electrocardiographic studies, they say that in thirty of the thirty-three cases the electrocardiograms were normal. One case presented rhythmic disturbances. Repeated electrocardiographic tests disclosed abnormal tracings indicating that this was a typical case of the syndrome of Wolff, Parkinson and White. Only after intense questioning did this patient recall short attacks of palpitation. One patient had an abnormal P wave. This patient had a history of rheumatism; he had a mitral stenosis and the electrical axis was deviated to the right. In one case the PR interval was prolonged. Clinically the heart was normal and the anamnesis was negative. Several aspects which were observed in this series or reported in the literature, such as an inversion of T₂ or a deep Q₃, are regarded as of no pathologic significance. The authors conclude that the electrocardiogram in muscular dystrophy can be altered in subjects who have signs or clinical symptoms of cardiopathy. In general it does not bring to light any new fact that can be attributed to latent or hidden cardiac lesions.

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20: 361-395 (Jan. 14) 1940

*Influence of Intensity of Muscular Exertion on Diuresis, Albuminuria and Cylindruria. A. Govaerts and R. de Lanne.—p. 361.
Some Observations on Vaginal and Cervical pH: Its Role and Variations. L. M. Pierra.—p. 370.

Muscular Exertion and Albuminuria.

—Govaerts and de Lanne point out that albuminuria may appear after intense muscular exertion. Several theories have been advanced to explain this phenomenon. Hellebrandt and others have shown that the appearance of albumin in the urine after exertion is in harmony with the fall in differential pressure designated as the "negative phase," which is always observed after an exercise of a certain intensity. They explain that by a peripheral vasodilatation which is brought on by the exercise the renal circulation is reduced and the resulting renal anoxemia is incompatible with the normal functioning of the organ. Wamisch and Meyler, on the other hand, believe that modification in the output and in the urinary pH explain the albuminuria of effort. Govaerts and de Lanne decided to investigate these two theories. They made their studies on athletes. The exertion consisted of running. In the first experiment urine was obtained before and after a period of rest. During a second period of rest the runner ingested 200 cc. of water, and the arterial and differential pressures and the oscillometric index were determined. Immediately before the onset of the run the athlete rested and took another 200 cc. of water. The arterial pressure and the oscillometric index were determined repeatedly at short intervals. Every twenty minutes a new specimen of urine was collected. It was found that this

exertion did not cause albuminuria. In the second experiment, however, a longer distance was run (3,330 meters) and the total quantity of water taken was 500 cc. The negative phase of the differential pressure corresponded to the appearance of albuminuria. The variations in the p_H were insignificant during the first forty minutes, but after that the urine tended to become alkaline. There was a reduction in the diuresis and there were albuminuria and cylindruria. In the third experiment the exertion was of greater intensity but of shorter duration. Comparison of the results of the three experiments revealed that the diuresis tends to diminish as the intensity of the effort is increased, in spite of the ingestion of large quantities of liquid. Exertion of moderate intensity does not lead immediately to albuminuria, but intense exertions produce albuminuria. This albuminuria is of short duration, persisting for hardly more than an hour. It corresponds generally to a reduction of the urinary p_H and disappears as the p_H becomes alkaline. In the fourth and fifth tests the authors aimed to determine whether the albuminuria and cylindruria will appear if the decrease in p_H , which is induced by intense exertion, is prevented by the ingestion of alkalis. It was observed that the ingestion of 15 Gm. of sodium bicarbonate in fractionated doses prevented the appearance of albuminuria under conditions identical to those which had otherwise induced it. The authors conclude that the appearance of albuminuria in the course of muscular exertion is related to the intensity of the effort. The albuminuria thus induced is temporary, appearing only at the time of decrease in differential pressure. The early ingestion of an alkaline substance in a quantity sufficient to maintain the urinary p_H in an alkaline zone after the exertion reduces or even prevents the appearance of albuminuria.

Journal Belge d'Urologie, Brussels

12: 309-360 (Dec.) 1939

- *Tumors of Kidney with Gastric or Intestinal Symptomatology. C. Perrier.—p. 309.
*How Can the Operative Sequels of Suprapubic Prostatectomy Be Shortened and Simplified? E. Jaeggy.—p. 317.
Three Cases of Operation of V. Richer: Analysis of Indications for this Operation. B. Fey.—p. 327.
Pathogenesis of Uncontrollable Hemorrhages of Prostatic Adenoma. Van den Branden.—p. 334.
Renal Lithiasis. F. Moyson.—p. 336.
Cystoscopy in Cancer of Uterine Cervix. Le Clerc-Dandoy and S. Simon.—p. 350.

Renal Tumors with Gastric or Intestinal Symptomatology.—Perrier directs attention to renal neoplasms in which the clinical picture is dominated by or made up exclusively of a digestive symptomatology. He first reports three cases presenting gastric symptoms. In the first case the gastric phenomena proved to be due to displacement and compression of the pylorus and the duodenum by a tumor of the left kidney. In the second and third cases the removal of a hypernephroma was followed by the disappearance of all gastric phenomena. In three other cases reported by the author, intestinal symptoms predominated. In these cases it was found that the renal tumor had caused displacement and compression of the colon and duodenum. The author emphasizes that pyelography in cases of this type makes possible a correct diagnosis.

Sequels After Suprapubic Prostatectomy.—Jaeggy shows that by appropriate measures the duration of the postoperative sequels after suprapubic prostatectomy is shortened, the postoperative care is simplified, and the prolonged duration of the hypogastric fistula and the danger of a hernia of the cicatrice are excluded. The following measures aid in arriving at this result: 1. The derivation of urine and blood through the perineum according to Fullerton. 2. The establishment of a partition constituted by the abdominal rectus muscles and their sheath, which is interposed between the cutaneous fold on the one hand and the bladder and its drainage tube on the other. 3. The evacuation of urine and blood, effected with the aid of a long tube (160 cm.) which enters the abdominal wall through a small incision in the linea alba (2 cm. below the umbilicus), advances behind the muscular partition, penetrates the bladder at its apex and emerges from it by traversing the prostatic capsule and the perineum. The wick used for tamponing the prostatic cavity emerges through the same

perineal opening as does the tube. The author says that by thus prolonging the surgical operation by scarcely fifteen minutes and by reinforcing the aseptic measures it is possible to shorten the period of disablement by at least fifteen days.

Monatsschrift für Psychiatrie und Neurologie, Basel

102: 1-64 (No. 1) 1939

- Psychogenic Delirium: Failure of Insulin Shock Therapy, Cure by Continued Sleep (Prolonged Narcosis). A. Favre and P. Danjou.—p. 1.
*Appearance of Hallucinatory-Cataleptic Anxiety Syndrome Attacks of Wakefulness and Similar Disturbances in Schizophrenic Patients. C. Rosenthal.—p. 11.
Problem of Brain Tumor and Cranial Trauma: Contribution to Pathogenesis of Cerebral Cysts in Simultaneous Formation of Tumor. I. Scheinker.—p. 39.
Two Cases of Menstrual Psychoses: Etiology and Therapy. H. Hoff and J. A. Shaby.—p. 58.

Attacks of Wakefulness in Schizophrenia.—Rosenthal shows that wakefulness and the hallucinatory-cataleptic anxiety syndrome are comparatively frequent in schizophrenia, for they were present in almost one fourth of an unselected material of seventy cases. They are of extrapsychic origin and are related to the sympathetic centers. They are not characteristic for schizophrenia but appear in the same manner in persons without physical or mental defects, particularly during the time of puberty and in connection with certain disturbances in the central nervous system such as true narcolepsy and certain forms of epidemic encephalitis, the sequels of which are characterized not only by parkinsonism but chiefly by endocrine and sympathetic disturbances. Their appearance in connection with schizophrenia, as far as it is possible to judge from previous observations, is due not to a particular form of schizophrenia but rather to the constitutional type of the patient; that is, they appear in psychasthenic persons with an unstable sympathetic nervous system. The fact that the hallucinatory-cataleptic anxiety syndrome and wakefulness appear in certain cases of schizophrenia suggests that schizophrenia occasionally has a special affinity for the autonomous centers of the mesencephalon, by which disturbances of the brain stem mechanisms can be brought about as by physiologic endocrine crises or certain forms of epidemic encephalitis.

Zeitschrift für Immunitätsforschung, Jena

97: 189-272 (Dec. 28) 1939

- Activation of Virus of Chicken Pest by Erythrocytes. E. Weineck.—p. 189.
*Experimental Foundation and Immunologic Results of New Method of Treatment of Diphtheria: Diphtheric Serotoxoid Therapy. G. Ramon.—p. 194.
Serologic Antigen Analysis of Inoculation Tumors. W. Oswald.—p. 219.
Terminal Agglutination in Antileptospiral Serology. A. Bessemans, P. Wittebole and R. Devuyt.—p. 238.
Method for Producing Purified Tuberculin. J. Vászárhelyi and B. Gözsy.—p. 255.
Chromatographic Adsorption of Purified Tuberculin. B. Gözsy and J. Vászárhelyi.—p. 265.

Serum-Toxoid Therapy of Diphtheria.—Ramon says that the idea to utilize the toxoids not only in the prevention but also in the treatment of toxo-infections was expressed in the first publications about these new antigens (1925). Of course the exclusive use of toxoid in the treatment of a disease developing as rapidly as diphtheria is out of the question. The immunity which is produced by diphtheric toxoid, to which it owes its efficacy in the prophylaxis of diphtheria, is established in a relatively slow manner and thus the diphtheric patient might succumb before he had derived benefit from the toxoid. Consequently the injection of antidiphtheric serum remains the primary and most pressing measure in the treatment of existing diphtheria. It furnishes the patient's organism with the antitoxin with which it can combat the invading intoxication. Nevertheless there is reason to inquire whether specific toxoid therapy combined with serotherapy is not capable of completing the effects of the latter. Although the antidiphtheric serum has produced remarkable results in the treatment, it has some limitations. The "passive" immunity produced by the serum is ephemeral, because the antitoxin furnished by it is rapidly eliminated. It is believed that this rapid loss of the antitoxin is at the source of the relapses which appear a short time after the initial lesion of diphtheria. In addition, the rapid disappearance of the antitoxin is not without influence on the severity of certain late manifestations of diphtheria. It has been sug-

remain confined to it or subsequently spread to other lobes. The author reports a case in which the disease started in the middle lobe and later involved the whole of the right lung. Further he describes a case of bronchiectasis in the collapsed middle lobe. This case offers a good example of silent bronchiectasis; that is, bronchiectasis without sputum. This condition is easy to miss, for not only are there often no abnormal physical signs but also the straight roentgenogram may show little that is abnormal save perhaps slight increase in the linear striation in the region of the middle lobe. Most of the cases which the author has encountered have been detected by routine bronchograms taken in the investigation of cases of slight hemoptysis in which no evidence of tuberculosis could be found. The described case of massive collapse of the right middle lobe resulting from obstruction to the bronchus leading to it illustrates the extreme importance of bronchoscopy in all cases in which a bronchial carcinoma is suspected. The fourth case described concerns bronchial carcinoma. The author describes a case of interlobar effusion which demonstrates that a collection of fluid in the lesser fissure of the lung may cause an opacity in the region normally occupied by the right middle lobe. In the summary the author stresses that, owing to the anatomic position of the right middle lobe, especially when it is partially or completely collapsed, disease of it often produces few, if any, abnormal physical signs. The shadows produced in the straight roentgenograms, in both the anteroposterior and lateral views, by the pathologic conditions enumerated are often very similar in appearance. It is often only by further methods of examination, such as bronchography, bronchoscopy and exploratory puncture of the chest, that a differential diagnosis between them can be made.

Vitamin E in Muscular Dystrophies and Nervous Diseases.—Bicknell says that Einarson and Ringsted have suggested that the muscular dystrophies, amyotrophic lateral sclerosis and tabes dorsalis are due to a deficiency of vitamin E. Bicknell reviews experimental studies conducted by Ringsted, Einarson and others. It occurred to him that before beginning to use vitamin E for human diseases it is necessary to decide whether it could be insufficient in normal diets. Foods which should contain a small amount of vitamin E may well contain none by the time they are eaten. Moreover, of the foods which are rich in the vitamin, the most important, wheat germ, is to all intents and purposes never eaten. Green leaves, the other rich source of vitamin E, are eaten though never in large quantities by dried weight. It is not therefore unreasonable to consider that diets may in some cases be on the edge of a vitamin E deficiency: a deficiency which might become serious if for any reason absorption from the intestine was impaired or if the demands of the muscular and nervous systems were higher than normal, either from a hereditary disposition or from toxic influences, such as syphilis in tabes. Many obscure lesions of the muscular and nervous systems might be explained in this way. Tabes would be regarded as the result not of syphilis alone but also of a deficiency of vitamin E, causing degeneration of nerve tracts already weakened by syphilis. The muscular dystrophies and amyotrophic lateral sclerosis would be interpreted as the same deficiency disease having one form in children and another in adults. The author resorted to treatment with fresh dried whole wheat germ one half ounce twice daily in twenty-six cases: eighteen of muscular dystrophy, four of amyotrophic lateral sclerosis, two of tabes dorsalis, one of peroneal muscular atrophy and one of amyotonia congenita. In the group of the myopathies—chiefly children—the results of treatment with vitamin E were remarkable. Every patient except one improved who was treated for more than six weeks. Not enough patients with amyotrophic lateral sclerosis have been treated for the results to be definite, but on the whole the author thinks they are promising. The two cases of tabes were too advanced for the negative results to be of any value. The man with peroneal muscular atrophy has not been treated long enough for any conclusions to be drawn. The small girl with amyotonia congenita appeared to have been greatly improved. It appears reasonable to suggest that in all degenerations of the muscular or nervous systems, such as disseminated sclerosis, a large supply of vitamin E should be of value.

Archives des Maladies du Cœur, Paris

32: 945-1040 (Nov.-Dec.) 1939

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20: 361-395 (Jan. 14) 1940

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 Some Observations on Vaginal and Cervical put: Its Role and Variations. L. M. Pierra.—p. 370.

Muscular Exertion and Albuminuria.—Govaerts and de Lanne point out that albuminuria may appear after intense muscular exertion. Several theories have been advanced to explain this phenomenon. Hellebrandt and others have shown that the appearance of albumin in the urine after exertion is in harmony with the fall in differential pressure designated as the "negative phase," which is always observed after an exertion of a certain intensity. They explain that by a peripheral vasodilatation which is brought on by the exercise the renal circulation is reduced and the resulting renal anoxemia is incompatible with the normal functioning of the organ. Wamisch and Meyler, on the other hand, believe that modifications in the output and in the urinary pH explain the albuminuria of effort. Govaerts and de Lanne decided to investigate these two theories. They made their studies on athletes. The exertion consisted of running. In the first experiment urine was obtained before and after a period of rest. During a second period of rest the runner ingested 200 cc. of water, and the arterial and differential pressures and the oscillometric index were determined. Immediately before the onset of the 2,760 meter run the bladder was again emptied. After the run the athlete rested and took another 200 cc. of water. The arterial pressure and the oscillometric index were determined repeatedly at short intervals. Every twenty minutes a new specimen of urine was collected. It was found that the

exertion did not cause albuminuria. In the second experiment, however, a longer distance was run (3,330 meters) and the total quantity of water taken was 500 cc. The negative phase of the differential pressure corresponded to the appearance of albuminuria. The variations in the p_{H_2} were insignificant during the first forty minutes, but after that the urine tended to become alkaline. There was a reduction in the diuresis and there were albuminuria and cylindruria. In the third experiment the exertion was of greater intensity but of shorter duration. Comparison of the results of the three experiments revealed that the diuresis tends to diminish as the intensity of the effort is increased, in spite of the ingestion of large quantities of liquid. Exertion of moderate intensity does not lead immediately to albuminuria, but intense exertions produce albuminuria. This albuminuria is of short duration, persisting for hardly more than an hour. It corresponds generally to a reduction of the urinary p_{H_2} and disappears as the p_{H_2} becomes alkaline. In the fourth and fifth tests the authors aimed to determine whether the albuminuria and cylindruria will appear if the decrease in p_{H_2} , which is induced by intense exertion, is prevented by the ingestion of alkalis. It was observed that the ingestion of 15 Gm. of sodium bicarbonate in fractionated doses prevented the appearance of albuminuria under conditions identical to those which had otherwise induced it. The authors conclude that the appearance of albuminuria in the course of muscular exertion is related to the intensity of the effort. The albuminuria thus induced is temporary, appearing only at the time of decrease in differential pressure. The early ingestion of an alkaline substance in a quantity sufficient to maintain the urinary p_{H_2} in an alkaline zone after the exertion reduces or even prevents the appearance of albuminuria.

Journal Belge d'Urologie, Brussels

12: 309-360 (Dec.) 1939

- *Tumors of Kidney with Gastric or Intestinal Symptomatology. C. Perrier.—p. 309.
- *How Can the Operative Sequels of Suprapubic Prostatectomy Be Shortened and Simplified? E. Jaeggy.—p. 317.
- Three Cases of Operation of V. Richer: Analysis of Indications for this Operation. B. Fey.—p. 327.
- Pathogenesis of Uncontrollable Hemorrhages of Prostatic Adenoma. Van den Branden.—p. 334.
- Renal Lithiasis. F. Moyson.—p. 336.
- Cystoscopy in Cancer of Uterine Cervix. Le Clerc-Dandoy and S. Simon.—p. 350.

Renal Tumors with Gastric or Intestinal Symptomatology.—Perrier directs attention to renal neoplasms in which the clinical picture is dominated by or made up exclusively of a digestive symptomatology. He first reports three cases presenting gastric symptoms. In the first case the gastric phenomena proved to be due to displacement and compression of the pylorus and the duodenum by a tumor of the left kidney. In the second and third cases the removal of a hypernephroma was followed by the disappearance of all gastric phenomena. In three other cases reported by the author, intestinal symptoms predominated. In these cases it was found that the renal tumor had caused displacement and compression of the colon and duodenum. The author emphasizes that pyelography in cases of this type makes possible a correct diagnosis.

Sequels After Suprapubic Prostatectomy.—Jaeggy shows that by appropriate measures the duration of the post-operative sequels after suprapubic prostatectomy is shortened, the postoperative care is simplified, and the prolonged duration of the hypogastric fistula and the danger of a hernia of the cicatrice are excluded. The following measures aid in arriving at this result: 1. The derivation of urine and blood through the perineum according to Fullerton. 2. The establishment of a partition constituted by the abdominal rectus muscles and their sheath, which is interposed between the cutaneous fold on the one hand and the bladder and its drainage tube on the other. 3. The evacuation of urine and blood, effected with the aid of a long tube (160 cm.) which enters the abdominal wall through a small incision in the linea alba (2 cm. below the umbilicus), advances behind the muscular partition, penetrates the bladder at its apex and emerges from it by traversing the prostatic capsule and the perineum. The wick used for tamponing the prostatic cavity emerges through the same

perineal opening as does the tube. The author says that by thus prolonging the surgical operation by scarcely fifteen minutes and by reinforcing the aseptic measures it is possible to shorten the period of disablement by at least fifteen days.

Monatsschrift für Psychiatrie und Neurologie, Basel

102: 1-64 (No. 1) 1939

- Psychogenic Delirium: Failure of Insulin Shock Therapy, Cure by Continued Sleep (Prolonged Narcosis). A. Favre and P. Danjou.—p. 1.
- *Appearance of Hallucinatory-Cataleptic Anxiety Syndrome Attacks of Wakefulness and Similar Disturbances in Schizophrenic Patients. C. Rosenthal.—p. 11.
- Problem of Brain Tumor and Cranial Trauma: Contribution to Pathogenesis of Cerebral Cysts in Simultaneous Formation of Tumor. I. Scheinker.—p. 39.
- Two Cases of Menstrual Psychoses: Etiology and Therapy. H. Hoff and J. A. Shaby.—p. 58.

Attacks of Wakefulness in Schizophrenia.—Rosenthal shows that wakefulness and the hallucinatory-cataleptic anxiety syndrome are comparatively frequent in schizophrenia, for they were present in almost one fourth of an unselected material of seventy cases. They are of extrapsychic origin and are related to the sympathetic centers. They are not characteristic for schizophrenia but appear in the same manner in persons without physical or mental defects, particularly during the time of puberty and in connection with certain disturbances in the central nervous system such as true narcolepsy and certain forms of epidemic encephalitis, the sequels of which are characterized not only by parkinsonism but chiefly by endocrine and sympathetic disturbances. Their appearance in connection with schizophrenia, as far as it is possible to judge from previous observations, is due not to a particular form of schizophrenia but rather to the constitutional type of the patient; that is, they appear in psychasthenic persons with an unstable sympathetic nervous system. The fact that the hallucinatory-cataleptic anxiety syndrome and wakefulness appear in certain cases of schizophrenia suggests that schizophrenia occasionally has a special affinity for the autonomous centers of the mesencephalon, by which disturbances of the brain stem mechanisms can be brought about as by physiologic endocrine crises or certain forms of epidemic encephalitis.

Zeitschrift für Immunitätsforschung, Jena

97: 189-272 (Dec. 28) 1939

- Activation of Virus of Chicken Pest by Erythrocytes. E. Weineck.—p. 189.
- *Experimental Foundation and Immunologic Results of New Method of Treatment of Diphtheria: Diphtheric Serotoxoid Therapy. G. Ramon.—p. 194.
- Serologic Antigen Analysis of Inoculation Tumors. W. Oswald.—p. 219.
- Terminal Agglutination in Antileptospiral Serology. A. Bessemans, P. Wittebolle and R. Devuyt.—p. 238.
- Method for Producing Purified Tuberculin. J. Vászárhelyi and B. Gözsy.—p. 255.
- Chromatographic Adsorption of Purified Tuberculin. B. Gözsy and J. Vászárhelyi.—p. 265.

Serum-Toxoid Therapy of Diphtheria.—Ramon says that the idea to utilize the toxoids not only in the prevention but also in the treatment of toxo-infections was expressed in the first publications about these new antigens (1925). Of course the exclusive use of toxoid in the treatment of a disease developing as rapidly as diphtheria is out of the question. The immunity which is produced by diphtheric toxoid, to which it owes its efficacy in the prophylaxis of diphtheria, is established in a relatively slow manner and thus the diphtheric patient might succumb before he had derived benefit from the toxoid. Consequently the injection of antidiphtheric serum remains the primary and most pressing measure in the treatment of existing diphtheria. It furnishes the patient's organism with the antitoxin with which it can combat the invading intoxication. Nevertheless there is reason to inquire whether specific toxoid therapy combined with serotherapy is not capable of completing the effects of the latter. Although the antidiphtheric serum has produced remarkable results in the treatment, it has some limitations. The "passive" immunity produced by the serum is ephemeral, because the antitoxin furnished by it is rapidly eliminated. It is believed that this rapid loss of the antitoxin is at the source of the relapses which appear a short time after the initial lesion of diphtheria. In addition, the rapid disappearance of the antitoxin is not without influence on the severity of certain late manifestations of diphtheria. It has been sug-

gested that repeated injections of serum might prevent or lessen these manifestations. However, repeated injections of serum are not always inoffensive. Moreover, the passive immunity conferred by the serotherapy cannot protect the treated subjects against early or late recurrences. To remedy these different shortcomings of serotherapy it seemed advisable to combine serotherapy and the immunization by specific toxoid. A method of combining the two had to be found and the author takes up first the simultaneous injections of antidiphtheric serum and diphtheric toxoid and second the various mixtures of diphtheric antitoxin and toxoid. He reviews animal experiments with these two methods and then discusses the diphtheric serum-toxoid therapy in human subjects and the immunologic results obtained with it. In the technic evolved for human subjects, the patient is given first a subcutaneous injection of 0.1 cc. of concentrated diphtheric toxoid (containing 150 units per cubic centimeter), and after several moments (about twenty minutes) a subcutaneous injection of a single massive dose of antidiphtheric serum is administered. Two days later the patient is given another injection of toxoid (0.5 cc.), which in turn is followed at five day intervals by progressive doses of toxoid: 1 cc., 2 cc. and 3 cc. The author reviews cases in which this method was employed and describes tests on the immunity produced thereby. He concludes that the serum-toxoid therapy is capable of producing a continuity of passive immunity as the result of the antidiphtheric serum and of the active immunity which is produced by the toxoid.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

53: 5919-6010 (Dec. 23) 1939

- Increased Intracranial Pressure. A. Gans.—p. 5920.
 *Value of Periodic Examination of Adults Who Have Contact with Tuberculous Patients. W. A. Griep.—p. 5928.
 Resistance of Gonococci in Vitro Toward Temperatures of 50 C., 45 C. and 41.5 C. P. J. van Putte.—p. 5934.
 *Considerable Improvement of Sympathetic Ophthalmia by Use of Sulfapyridine and Injections of Liver Preparations. M. C. Colenbrander.—p. 5939.

Periodic Examination of Adult Tuberculous Contacts.—Griep points out that a considerable percentage of patients with pulmonary tuberculosis are not committed to a sanatorium because, when discovered, the disease has advanced to a stage at which treatment in a sanatorium no longer promises results. The cause of this late discovery of the disease is probably the fact that incipient tuberculosis causes few symptoms. Since tuberculosis is contagious, new cases should be searched for among persons coming in contact with tuberculous patients. To make this possible, all patients with tuberculosis should be registered. The author thinks that especially the members of the family should be kept under observation, but he cites cases indicating that extrafamilial contacts with tuberculous patients may likewise lead to infection. Periodic examination of persons who have contact with tuberculous patients has two advantages: 1. The early discovery of tuberculosis gives promise of a complete cure. 2. By reducing the number of sources of infection, the incidence of tuberculosis will be reduced. The author says that of the 103 patients with pulmonary tuberculosis observed at his institute in the course of one year, sixty-nine had been sent there by their physician, nine had come of their own accord and twenty-five had been discovered by control examinations. Comparison of the three groups with regard to positivity of the sputum and to the extensiveness of the pulmonary process reveals that the cases discovered as the result of control examinations showed a much more favorable condition than were the others. Moreover, the mortality rate was much lower in the group discovered by control examinations than in the other groups.

Sulfapyridine and Liver Extract in Sympathetic Ophthalmia.—Colenbrander reports a case of sympathetic ophthalmia in which he resorted to treatment with sulfapyridine and liver extract. The sulfapyridine was given by mouth and the liver extract by injection. The result of this treatment was surprisingly favorable. The visual acuity increased in a short time from 1/8 to 1/2 and later varied between 3/4 and 1; the signs of infection disappeared. The author admits that in cases of sympathetic ophthalmia favorable and unfavorable periods may alternate; however, the improvement which followed the administration of sulfapyridine and liver has so far persisted for eight months.

Acta Ophthalmologica, Copenhagen

17: 359-498 (No. 4) 1940. Partial Index

- Concomitant Strabismus in French Equatorial Africa: Problem of Race and Strabismus. S. Holm.—p. 367.
 Some Cases of Sympathetic Ophthalmia. J. P. Jensen.—p. 388.
 Granulocytopenia with Ocular Lesion: Case. A. Löwegren.—p. 412.
 Influence of Odors on Color Vision. S. V. Kravkov.—p. 426.
 *Cataracta Electrica Following Electric Shock. H. Skydsgaard.—p. 460.
 *Treatment of Gonorrheal Conjunctivitis by Means of Sulfapyridine. R. Sysi.—p. 466.
 Bone Metaplasia in Eye. S. Wegener-Thomsen.—p. 482.

Electrical Cataract Following Electrical Trauma.—Skydsgaard thinks that, of eye injuries resulting from electrical trauma in persons struck by lightning or in those who work with high tension currents, one of the most important is the delayed cataract which occasionally appears. He reports the history of a man aged 44 who was employed on high tension work and who, about a year and a half ago, received an electric shock (6,000 volts). He lost consciousness and when brought to the hospital he was found to have extensive burns on the left hand and wrist and on the right arm. There were also burns on the left side of the face and on the nose. During the first half year after the accident the patient noticed nothing wrong with his eyes, but after that there was a gradually increasing loss of vision in the right eye and a cataract was discovered. The anterior surface of the lens had a cataractous opacity of somewhat irregular polygonal form, measuring about 1.5 by 1.5 mm. Slit lamp examination showed that the opacity was localized in the anterior capsule and the outermost subcapsular parts of the lens. The opacity projected slightly above the level of the remainder of the lens capsule; the shagreen pattern of the other parts of the anterior surface of the lens was normal. In addition to the cataractous part there was seen in the remainder of the most anterior part of the lens capsule a network of fine, linear, cataractous opacities, resembling cotton fibers, their arrangement having no relation to the lenticular structure. In the interstices there were fine, punctate opacities. Ophthalmoscopy revealed a normal fundus and the tension was normal. The field of vision was normal for hand movements. The left eye was healthy in all respects. The author is convinced that this cataract was caused by the electrical trauma. He says that electrical cataracts often present only features that are common to a large group of cataracts. He stresses that the electrical cataract appears late and that it may be either unilateral or bilateral. Contrary to the opinions of some investigators, he maintains that electrical lesions in the proximity of the eye are not an essential condition for the development of the cataract. The strength of the current does not appear to be of decisive importance in the production of cataract. A tension of 500 volts may result in mature cataract, while tensions even up to 80,000 volts have been known to produce only partial cataract. It is probable that in this respect considerable importance attaches to the duration of the passage of the current. The cataract may be regarded as due (1) to the mechanical effects of the electric current or the lightning on the lens or on its suspensory ligaments, or to caloric or chemical (electrolytic) changes resulting in the destruction of the epithelium of the lens capsule or (2) to impairment of the nourishment of the lens owing to inflammation produced in the ciliary body and in the iris. Finally, (3) the aqueous may be altered by the electrolytic effect of the current. None of these theories alone would appear to suffice for the explanation of all cases, whereas a combination of them provides a plausible explanation.

Sulfapyridine in Gonorrheal Conjunctivitis.—Sysi reports eleven cases of gonorrheal conjunctivitis in which he used sulfapyridine. In the first five, in addition to the oral administration of sulfapyridine, local applications of silver nitrate and of mild protein silver were given. In the other cases the local treatment consisted only in irrigations with physiologic solution of sodium chloride, but the improvement was the same in all cases. The sulfapyridine was given in the large doses that are customary in lobar pneumonia. In two cases, nausea and cyanosis appeared but subsided rapidly after the medication was discontinued. Although in the reported cases the local treatment was made superfluous by the sulfapyridine medication, the author admits that the material is too small to decide whether sulfapyridine will always do this.

THE STUDENT SECTION

of the

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Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals

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Some Criteria on the Selection of Medical Students

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CHICAGO

In any community the medical profession is no better than a cross section of its members. It may be granted that our schools have been offering, for the past twenty years at least, reasonably good training. As some institution has graduated every physician now in practice, the responsibility for standards of service is theirs. If weaknesses are apparent we may look not at the product but at the raw material which they have attempted to fabricate. While a college career cannot alter the inherent traits or the embryonal genes of any man or woman, nevertheless the influence of the classroom in the building of ideals may be substantial. Students come to us, for the most part, neither wise nor deeply learned. It is our job to see that they are no worse off when they leave. Today medicine is puzzled, even bewildered, not because our technics have not advanced but because public appreciation of our efforts has dropped, at least in some quarters.

It has been stated that the members of our group are now accorded less respect and less understanding than at any time certainly in the past two generations. Can it be that the faculties of medicine are failing to employ every procedure likely to strengthen character, to mold a generation of influential citizens? While we may question the accuracy of some of these assertions it can do no harm to indulge in a moderate amount of introspection.

In 1910 the Flexner report—the most powerful and stimulating educational document ever published—forced medical schools to increase requirements, seek university affiliations and improve both laboratory and clinical teaching. Standards and curriculum loads have risen consistently, until in 1940 our undergraduates are obliged to work harder and to know much more. The length of the course has practically doubled, even though we do not include the years necessary to qualify for one of the specialty boards. All this in three decades!

Academically minded young men and women are attracted to our halls. The more difficult it is to gain admission to a reputable institution, the greater the demand appears to be. But in stressing the technical phases of schooling have we not deprived our students of many intangibles, certain points of view, that should be numbered among the attributes of a good doctor? As Oliver Wendell Holmes once remarked, "Science is a first rate piece of furniture for a man's upper chamber, if he has common sense on the ground floor." It is a veritable truism that the medical man who is all cold crystalline science is like a body without soul. We may say further that there is no place in the healing art for sharpness, shrewdness or those tricks of trade which may make for success (with but few, let us hope) in the commercial world. How can we be sure that we are not swinging the figurative pH too far to the acid side, curdling, as it were, the milk of human kindness?

Assured by his college record that the candidate is intelligent, we should ask Is he industrious? A lazy man possessed of brains is dangerous. Emphasis thereafter may be placed on mental stability and on character. Each is a birthright. Neither can be fortified, except in minor degree, by years of tutelage, although both are susceptible to some weakening. Does the student possess what is termed fundamental honesty and integrity? If he lacks sound moral worth, the effort expended on him will be worse than wasted. We may be guilty of endorsing with a diploma a menace to society.

The desire to "get by" which has permeated daily affairs has filtered all too deeply into education. The motivating force, get all you can but give as little as possible, is unsound in principle and false in concept.

It is a matter of common knowledge that in certain quarters at least the public is coming to look on the physician with some question. By bitter experience some have learned that a given medical man is not entitled to the confidence that his calling should guarantee. Is it true

that instances of this sort are increasing? More than any other the medical adviser must personify honor, steadfastness and truth, for every sick individual is a trust that cannot be betrayed. About all that the unprincipled lawyer can do is to steal money. His counterpart in medicine, however, may filch life.

REQUISITES FOR MEDICAL STUDENTS

I would place character, then, first among those ancillary yet fundamental considerations for admission, and there are many ways to measure this vital endowment. Heredity may be studied with profit. By means of personal interviews, using interested alumni and other available sources including upper classmen from the same school or vicinity, the candidate's background can be envisioned with accuracy. Then too the lad's reactions toward his fellow students in prep school and college and his talents for leadership will afford many hints. Inquire closely into his motives for entering medicine. What are the actuating and directing forces? The suggestion that he submit a 500 word biography may be helpful.

Next in importance is an intense humanity which must be ingrained—second nature. The unfeeling, indifferent expert possessed of every refinement of skill rates about 10 per cent of par as a counselor when some member of the family is ill. For most of us sickness is an emotional experience, and as a rule we are unable to dissociate real interest and effective performance. Not long ago on a visit to a hamlet of a few thousand population I was cheered immeasurably by remarks which I heard on every hand to the effect that "Dr. Blank is the most valuable and outstanding citizen of our community." This prompts the rather bold assertion that the health of every locality would be enhanced by the presence of a generous hearted doctor. He may not know quite as much as his city colleagues the specialists, but he is faithful in guarding the welfare of his patients; his attention to their ills is so unremitting that disaster comes but rarely. Furthermore, he is the first to call for help when the occasion arises. We cannot read without a thrill Ian Maclaren's story of old Dr. MacLure of Drumtochty, who brought the great London surgeon to save the life of Annie Mitchell. What a noble physician John Keats would have made had not tuberculosis cut him off on the threshold of life and had his urge for medicine held through the years. Deeply imbued with an enduring affection for his fellow man, the author of the *Eve of St. Agnes* and the *Ode to a Nightingale* would have rendered a priceless service. But, some one may say, "Of what use is a nightingale anyway? It would never take a prize at a poultry show!" Therein lies the crux of the whole matter. We must seek and admit to our classes only those stu-

dents who are capable of understanding and appreciating the doubts and fears that beset the sick.

Next I would suggest that the applicant shall be possessed of certain cultural instincts. Only the necromancy of a chemical laboratory can transform a sow's ear into a silk purse. Our classrooms as yet are not adept at working miracles. However, the habit of reading good books plus an acquaintance with the world's literature, art and music does something to a man that makes him a better physician. Our demand for a broad intellectual outlook requires that our teachers shall live up to and exemplify the best traditions of scholarship. We lost much with the passing of the old time lecturer whose discourse was a model of diction, glowing with imagery. He had the power to illumine an otherwise dry subject with interest and color.

In addition to good mental pabulum our neophyte must possess the ability to think logically. After all, diagnosis is little more than a practical exercise in logic. It is the lack of this accomplishment that leads to scatterbrained incompetence, so destructive to lay confidence. Some possess it; others do not. It is our business to select those who do. A brief undergraduate course in this subject would be of value.

PERSONALITY REFLECTS THE MAN

Personality more often than not reflects the man and in his smile and demeanor we read his thoughts. Charlatans may cultivate the form but not the substance. Too much satire has been directed toward "a good bedside manner." It was Du Maurier's cartoon in *Punch* of March 15, 1884, that first called forth this phrase. The legend read "What sort of a doctor is he?" The reply was "Well, I don't know much about his ability; but he's got a very good bedside manner." The attributes of a gentleman reflect themselves in conduct and we all agree that there is no excuse for the occasional blunt, even brutal, approach to those who are in pain. Our candidate must be blessed with those traits of heart and mind which will lead his patients to the certain knowledge that he is personally concerned and that he will leave no stone unturned for their recovery.

In selecting our quality quota we must envision the market. What is the objective of medical training. Is it for service in pure science, research and investigation? Is it for medical practice, general or special? Certainly the assumption is sound that it is for all of these, and perhaps more, including the broader aspects of civic affairs in which a large majority of our colleagues should participate. At most, a small percentage of all who enter as freshmen will devote themselves solely to investigation, to the exclusion of contact with patients. By far the larger number will engage in practice, alert to new discoveries. From the vast

panorama of clinical material which comes within their purview there will emerge in the future, as in the past, useful and far reaching observations. A goodly proportion will carry into the field the habits of the laboratory.

QUALITIES OF GOOD PRACTITIONERS

As a profession we have accepted the obligation of caring for the sick. It can be neither shifted nor delegated to less competent hands. That it has been so shunted, all too generously, we are well aware. The birth of the healing cults is an admission of our failure. No, the level of our profession can rise no higher than its source, the grist out of which doctors are made. If we would preserve our historic ideals, the apotheosis of examination grades only must give way to the consideration of all those qualities that have typified good physicians in all lands in all times. We have been fixing our gaze on marks and little else, ignoring those transcendent traits which have held physicians high in public esteem. Many of us have long since got over the notion that the mere completion of courses guarantees desirable students. Our admission committees, then, must read between the lines; they must search the background of the prospect and say to themselves "Will this candidate become an honest doctor, devoted to his people?" There need be no let-down, not one whit, in our standards of scholastic accomplishment, but let us beware of the "smart" type, so likely to possess a mirror memory but lacking in moral fiber. Most of us have great admiration for and faith in young people. They are not, as has been alleged so often, developing into manhood and womanhood without aims and worthy objectives. Medicine needs them, but only those whose sincerity of purpose rises above selfishness and greed.

Furthermore, I would not have them all cut from the same educational fabric. The very diversity of pathways to the medical field serves as a homogenizing instrumentality in the student body. We have all seen diffident, even self-centered, bookwormish lads, sound at heart, develop into leaders; and in this connection we must not minimize the influence of the students, one on another. Not infrequently the remark is passed that a certain physician would have made a great lawyer, financier or industrialist. The healing art needs all talents—a composite of intellectual power.

MERITED PUBLIC CONFIDENCE

Built as it is on many branches of science, using every atom of knowledge that can be garnered, the only hope that medicine has for permanence lies in well merited public confidence. Otherwise we may become mechanics, record clerks and laboratory technicians with the punch card system disgorging the diagnosis and indicating treatment. In this connection

we may call to mind the remark attributed to Madame de Staël, "Napoleon is not a man but a system." If our plan of selecting medical students is weak, if because of shortsightedness we are drifting into a "system," we may well counsel as to the remedy lest we find ourselves in ruins amid our own good intentions.

Yes we must demand of those who aspire to follow in the footsteps of the great leaders of medical thought character, fidelity to duty and an unsurpassed devotion to the public weal. In this city, scarcely past the century mark in years, many of our citizens today recall the notable accomplishments of N. S. Davis, John Evans, Edmund Andrews, Christian Fenger, Nicholas Senn, John B. Murphy and scores of other distinguished men.

Edmund Andrews founded our Academy of Science, wrote widely on the geology of the Great Lakes and was the first to point the way to the use of oxygen and nitrous oxide as an anesthetic.

John Evans led in establishing two universities and his name is enshrined in the city of Evanston, Ill., and Mount Evans in Colorado.

Christian Fenger and Nicholas Senn are remembered daily by thousands of high school students who attend classes in massive structures bearing their names.

Nathan Smith Davis, father of the American Medical Association and first editor of *THE JOURNAL*, established a hospital and a medical school (which still survive) and his name lives in the annals of this, his adopted, city for untold good works.

Judged by the standards personified in these stalwarts and hundreds of others, the query comes Have we held our own in the affairs of our several communities? Perhaps our institutions, eager for scientific discoveries and for the outpouring of papers, have forgotten to stress those worthwhile qualities which, after all, are responsible in large part for the contributions of medicine to better and more healthful living. It is the job of our schools to guard their portals valiantly against those who are unworthy. Only then shall we be able to live up to the high estimate of Robert Louis Stevenson, who termed the physician "the flower of our civilization."

301 East Chicago Avenue.

Laws Bearing on Medical Practice

No physician is equipped to practice medicine unless he has had certain instruction relative to laws determining licensure, the practice and the legal obligations of the physician himself, sanitary codes of state and governmental regulations pertaining thereto, information concerning birth and death certificates, relation to the coroner and other simple items of detailed information seldom acquired. He should also know something of the broad system of laws, regulations and legislation affecting the entire population with their bearing on his medical practice.—Black, B. W.: *Community Aspects of Medicine*, J. A. Am. M. Coll. 13:19 (Jan.) 1938.

Comments and Reviews

MEDICAL LITERATURE

Abstract of the Lloyd Roberts lecture, delivered by Sir Robert Hutchison before the Medical Society of London and published in the Lancet Nov. 18, 1939.

The amount of writings of a profession is a measure of its vitality and activity, while their quality is a rough indication of its intellectual state. Medical literature is the currency by which a man contributes to or borrows from the common stock of knowledge and experience, and the volume of this currency and the character of its metal are of the greatest importance.

In surveying medical literature, the first thing that impresses one is its bulk. Professor Bulloch, who has given great attention to this subject, estimates that there are more than 5,000 medical periodicals of one sort or another in the world; others have put the number as high as 7,000. In this country, and we are more modest in output than many of our neighbors, there are about 130. The yearly crop of medical books in Great Britain amounts to more than 400. To quote Professor Bulloch again, on an average two articles on tuberculosis alone have been published every day for the last forty years. This gives one some idea of the immense fecundity of the medical press. This enormous proliferation is both a nuisance and a danger. The mere question of storage is a problem. In the library of the Royal Society of Medicine, room has to be found for 3,000 additional volumes each year, and these take up 60 feet of shelving 8 feet high. In a private house it is impossible to find room even for bound volumes of the weekly journals. The consequence is that tons of medical journals must be thrown into the dustbins every week. More serious is the effect on the purpose for which medical literature exists—the recording and interchange of knowledge. It is becoming increasingly difficult to find the needle in the haystack, the few grains in the heap of chaff. Facts may be said to be buried rather than recorded, and the fruits of the labors of our predecessors are apt to be lost. More and more, too, is it difficult for the workers in one field to keep in touch with what is being done in other fields.

HOW TO COPE WITH IT

Must we sit still and see science suffocated in its own secretions or can we do anything to mitigate the evil? How can we make the best use of medical literature without being overwhelmed by it? Current medical literature cannot be permanently ignored. Osler said "A

doctor who does not use books and journals, who does not need a library, who does not read one or more of the best weeklies and monthlies, sinks to the level of the cross-counter prescriber, and not alone in practice, but in those mercenary feelings and habits which characterize a trade."

All a busy practitioner can do is to tear out from his weekly journal those articles which interest him and which have a direct bearing on his work, and file them. In this way he will build up a collection to which, if it is properly indexed, he can refer as need arises.

For the contributor to medical literature, however, this is not enough. He needs a directory to help him find the publications relevant to his own work—and fortunately we have in the *Quarterly Cumulative Index Medicus* an excellent guide of this sort, to the producers of which medical writers can never be sufficiently grateful.

"GETTING UP THE LITERATURE"

But when the required articles have been found they have still to be read and abstracted. This is laborious business which requires nowadays a knowledge of foreign languages. More and more there is a tendency, which seems to have originated in America, to have bibliographies prepared and abstracts made by professional librarians. I view this labor saving device with no great favor. It seems best for each writer to do his own quarrying, for the librarian, however skilled in his own business, has had no medical training and cannot be expected to know the relative value of different papers or the points in any which should be picked out. He has therefore perforce to confine himself to a transcription of the summary of the paper, if a summary is given; but for the conscientious original writer a summary is not enough. The only excuse, indeed, for this way of "getting up the literature" is when the paper is written in some outlandish language, with which a librarian may have at least a working acquaintance, or when the student lives at a distance from any large medical library. In such a case, however, it is possible to send a photostat copy of any article required and that is far better than a mere abstract made by some one else. The ideal would be an international clearing house in which the whole periodical medical literature of the world would be sifted by experts and summaries made of such papers as contained any original as opposed to merely repetitive or didactic matter, the summaries being published in English,

French and German. In this way the pith of all current medical literature would be extracted and presented in readable form; but it is feared that such a plan is visionary.

What prompts doctors to write? Why, as Dr. Johnson wondered of literature in general, have so many people written "who might have let it alone?" The motives for medical writing are mixed. Good reasons are the necessity for putting on record new observations or results of experiments and the impulse to teach. Bad reasons are the desire for prestige and priority (of which the "preliminary note" is a familiar example) or the itch for advertisement. It is easy to be too censorious in this matter of alleged self advertisement, for after all the only way in which a young man can let it be generally known by his colleagues that he possesses special knowledge or skill in any department of work is by contributions to the professional journals. Writing from such motives is legitimate enough. But one must draw the line at the publication of the same paper in more than one journal and at the equally reprehensible practice of sending out reprints wholesale.

These motives being apparently so compelling, there is no need to add inducements to write. Among the uncalled for inducements I would include ceremonial orations, presidential addresses and in particular memorial lectures (such as this). The last have multiplied to such an extent as to have become a nuisance, and it is increasingly difficult to find people to give them or to collect audiences to listen to them. There are surely better ways of remembering the dead than by boring the living.

HOW TO CONTROL THE OUTPUT

In the first place there should be strict birth control with regard to new journals, there being too many already. Secondly, amalgamation of existing journals might be carried out in many cases. It is absurd, to take an example, that there should be two journals in this country devoted to diseases of children. Thirdly, some journals might be suppressed altogether. What we should aim at is to have the stream of publications gathered into as few channels as possible. Superfluous journals lead to superfluous writing, for their editors are sometimes driven to tout for contributions; instead of the editor having to woo the writer, it should be the writer who has to persuade the editor to find room for his article.

The chief means to check the flow of superfluous writing must be stricter editing. This would involve the refusal of many articles which find their way into print; but that need cause no regrets. Any one who has to read

large numbers of articles with a view to abstracting from them anything of value must be convinced of this. I found when doing such work for the *Medical Annual* that not more than a fifth of the articles sent to me were worth anything—the rest went into the waste basket.

Closely involved with the refusal of articles is the question of payment to writers. If a journal has any right to exist, there should be competition to get into it; I have been told by a professor in Germany that one reason for the many superfluous medical journals in that country is that they pay their contributors. Further, the articles which are accepted should be more drastically dealt with. We want more of the severe editing which Langley used to apply in the *Journal of Physiology* when he controlled it. Most articles are too long. "Was there ever anything written by mere man" (If I may again quote Dr. Johnson) "that was wished longer by its readers excepting Don Quixote, Robinson Crusoe and the Pilgrim's Progress?" And some readers would not except these. The capacity of the average person for sustained attention is exaggerated, and in every sphere there is need to practice the art of leaving off. Powerful astringents may be required to check the verbal diarrhea which afflicts many writers, but it is the business of the editor to administer them. Meanwhile every paper should have a summary appended.

WHY SO MANY BOOKS?

The average doctor is not much of a book buyer, and, considering how quickly medical books become out of date, one cannot blame him; the only best sellers in medical literature are textbooks which most students use for examinations or a few books which have a direct bearing on practice, such as works on therapeutics. Why are so many books written? The publishers, I think, are largely to blame. In their rivalry with competitors they persuade young would-be authors to write for them. The writer is flattered and argues that, whereas he may get some advantage out of writing the book, he can lose nothing; the publisher, on the other hand, recoups himself for his many failures at the expense of the more successful authors. It would be a great gain if, instead of issuing elaborate textbooks, publishers would provide us with more concise, fully documented monographs giving a complete account of present knowledge in a limited field and produced as cheaply as possible.

DULNESS OF MEDICAL LITERATURE

In considering the quality of medical literature, one has to distinguish between content and form. As regards content, one is struck with the excess of facts and the comparative

absence of ideas, generalizations and hypotheses; there is, in short, too much observation and too little reflection. Much of medical literature is like a heap of bricks without any mortar to hold them together. The power of wide generalization is rare, but medical writers might at least show greater imagination. The lack of this has the consequence that much medical literature is dull although the subject matter is interesting; for instance, the biography of a red blood corpuscle from its birth in the bone marrow, with its capillary wanderings and its moving adventures by flood and field to its normal gradual old age and burial in the spleen or to its tragic end in a hemorrhage. It might be made a vivid Odyssey, but how dull it sounds in a textbook of physiology. Medical writers are afraid of romance; they fight shy of humor. And yet it is probably true that a writer has never really mastered his material until he can jest about it; until then it has mastered him.

MANUFACTURED WORDS

Medical publications perhaps should not be literature, if one means by that "writings esteemed for beauty of form or emotional effect." Brevity, lucidity and reasonable observation of the rules of syntax are all that can be expected; the purple patch is out of place. But these simple demands are often not met. Lucidity is to some extent an outcome of the language a writer uses. It is difficult to be obscure in French and easy in German, while in the case of English all depends on how it is written, the man being more important than the medium. In all languages, however, it is probably true that clear thinking and clear writing go together.

It is an unfortunate result of the increasing specialization of knowledge that the writings in one department are often hardly understood by those outside it. I confess that many papers on medical psychology, biochemistry or iatromathematical subjects might, so far as I am concerned, as well be written in Chinese. Much of this obscurity is due to the use of jargon, but some of it is unavoidable. Such neologisms usually should be coined from Greek or Latin roots, but today there is a tendency to use new words of home manufacture. Many of the new Germanisms are of this class. Such terminologic self sufficiency is most certainly to be regretted.

ABSENCE OF LITERARY FORM

Medical literature exhibits too often an absence of style or even of grammar. The average of medical writing is probably not so high now as it was during the last century. We have no textbooks like those produced by

Michael Foster, Fagge or Osler, and the multiple productions which have succeeded them have lost the individual touch.

Slovenly writing often is the result of haste or carelessness. To a large extent, however, the root of the evil lies deeper and is a consequence of defective literary and linguistic education. The great models of English prose are probably less read by the younger generation, and a literary diet of newspapers, detective novels and the productions of scenario writers is no substitute for them.

THE PREVENTIVE AND INVESTIGATIVE ATTITUDES IN THE PRACTICE OF MEDICINE

Abridgment of address by Dr Henry J. Gerstenberger, given at the Commencement at Western Reserve University School of Medicine, Cleveland, June 14, 1939.

Prevention and investigation are the great ideas in medicine, the sensible application of which by you as physicians in practice will do most to make you fine physicians.

You must consider it your duty to discuss and, if necessary, to agitate with your families the need and advantages of applying preventive medicine in the home. The public is ready today to listen to earnest approaches in this direction. Let me enumerate some of the immediate objectives of such a plan, from the standpoint of the welfare of the mother and young child:

1. See to it that men and women, before they marry, are examined for syphilis, tuberculosis, hereditary tendencies to epilepsy, mental disabilities, blood dyscrasias and severe constitutional abnormalities.

2. To see that the pregnant mother is regularly examined to lessen the chances for the development of toxemia and that she has a diet to meet the added needs of the fetus, in order that nature need not call unduly on her body to safeguard the offspring; only when the diet of a mother is woefully incomplete and her own body stocks near depletion does the fetal organism begin to suffer.

3. To see that the infant is born at term and that he receives, as he nearly always can, his own mother's milk for a period of at least six months.

4. To see that the infant, before he is a year old, is vaccinated against smallpox and immunized against diphtheria and later against all other contagious diseases as soon as one can be certain that effective methods of protection are at hand.

5. To see that the infant's body and mind and its emotions are properly stimulated and trained by the mother and not by the maid.

6. To see that the infant gets his share of fresh air and sunlight, and when the latter in the darker half of the year becomes inadequate, that he if possible receive the advantages of its ideal alternative, artificial sunlight, or the next best substitute, cod liver oil, which in addition to the antirachitic factor supplies him with fat soluble vitamin A, iodine, iron and various fatty acids.

7. To see that when the infant is weaned he receives milk free from pathogenic germs and in addition fruit, vegetables, cereals and liver and, in due time, other meats and eggs to meet his needs for calories and for the essential food constituents, of which many are quite as important as are the much discussed vitamins and calcium; and to do this without getting the mother and the father befuddled about balancing the diet. Rather attempt to aid the parents balance the budget by urging them to feed the old fashioned cereals instead of the modern types proclaimed with bombast through the air and to get the vitamins from the grocery store in their natural state rather than in synthetic form from the drug store.

8. To see that parents have the proper kind of thermometer and that they use it immediately when the infant seems ill and call you if any degree of fever is found in order that you may at the earliest opportunity search the child from head to foot for its cause and begin to combat it.

9. To see that parents realize when the infant begins to toddle that he of necessity will come into contact with a variety of infectious agents and therefore off and on will have to battle with them.

10. To see that the child has the benefit of your knowledge of the constitutional peculiarities of its parents and relatives and that you search for indications of their existence in the patient; that you continue to aid the mother not only in keeping the child's body healthy but in training his mind and emotions.

THE INVESTIGATIVE ATTITUDE

The second attitude which I consider important in the practice of medicine is the investigative attitude. This is a combination of skepticism and inquisitiveness which takes nothing for granted and is anxious to know the reasons why the conditions found are not as they should be or why the treatment does not accomplish what was intended, and what course to pursue to obtain the desired result. Only when a physician constantly keeps in this frame of mind can he best diagnose, treat and prognosticate his patient's illness; when he, day in and day out, proceeds in this manner, he will become better and more skilful and may even come upon a fundamental truth that will benefit

all mankind. He even may uncover truths, as Robert Koch did while he was still a general practitioner and medicolegal officer in a small German town.

I have just finished reading the first volume of the fascinating work by Bruno Heymann on the life of Koch and would commend it to you as a source of inspiration and incentive. Koch came from a simple, large family such as one could frequently find in northern Ohio fifty or more years ago; many children, an able, active father, a fine mother, a good income, but barely adequate to meet the needs of a large family trying to educate its children. Robert Koch, with an excellent record at the university, preferred to go into practice in a village. Koch's motto, which as a medical student he wrote at the bottom of his prize essay, was "Nunquam otiosus," meaning "Never idle." Later, to his assistants when they were in despair over the progress of their work, his advice was "Nicht locker lassen!" (Don't let go!)

After three years of work, which proved to him that the organisms in his possession were the cause of anthrax, he wrote to Prof. Ferdinand Cohn at Breslau asking whether he would pass judgment on his work before he proceeded with publication. The reply was favorable, and in order to be in Breslau at the hour stated he left Woolstein at 1 o'clock in the morning by mail coach to reach after two hours a station of the railroad which would take him to Breslau. On arrival he proceeded to the institute with apparatus, dishes, reagents, rabbits, mice, frogs and microscope. The demonstrations lasted two days and were attended by the luminaries of the university, among whom were Weigert and Cohnheim. Weigert was performing a necropsy when Cohnheim went to see what Koch had to offer and when he returned he said to Weigert "Now drop everything and go directly to Koch; this man has made a great discovery with a method which is both simple and exact and for which he deserves all the more praise as he is entirely cut off from connections with scientific bodies and as he has brought this all out by himself in an absolutely finished form. There is nothing more to do. I consider this to be the greatest discovery in the field of micro-organisms and believe that Koch some day will surprise us with further discoveries." It is wonderful to realize that another Koch can come out of general practice, and he might be one of you! Stephen Paget wrote in his *Confessio Medici*: "The natural dignity of our work, its unembarrassed kindness, its insight into life, its hold on science—for these privileges, and for all that they bring with them, up and up, high over the top of the tree, the very heavens open, preaching thankfulness."

The Medical Book of the Month

THE STUDY OF ANATOMY

Whitnall has published a small book¹ intended for the use of medical students at the time of dissecting. The author emphasizes the importance of keeping in mind the living body and its relation to future clinical work. The dissection of cadavers is only one way of studying anatomy. The student should realize that man is his subject. The dead body is an imperfect means to establish the essential foundations on which the practice of medicine is based. It is obvious that anatomic structure in every part of the body has been designed and especially molded in response to a definite physiologic purpose. Form is determined by function. When dissecting, the student should constantly ask himself why this structure is so shaped and what it does, for his future interpretation of symptoms and his clinical diagnosis and treatment will be based on that very knowledge.

THE MOST VERSATILE SENSE ORGAN

The skin, which is wonderfully adapted to many purposes, will illustrate this method of study. The skin prevents the escape of body fluids. Its thickness varies in different parts of the body. It is freely movable in some places and tight in others, and the creases mark where it is bound down. It has minute ridges which improve the grip on the palm and sole and marvelously afford the only permanent and absolute means of personal identification with finger prints. With all our modern ingenuity in creating machinery and fabrics, we cannot create a tough yet highly elastic one that will withstand heat and cold, wet and drought, microbes and the wear and tear through the years and yet make its own repairs and even assemble in summer a protective pigment against the sun's rays. The very skin which you dissect is a regulator of body temperature, an excretory organ, and the largest and most versatile of our sense organs. The skin helps to form the ear drum, it covers the eye ball, from it originate the teeth, and in it are millions of tiny glands. Finally, when sunlight or ultraviolet is shed on it, the ergosterol in the skin produces vitamin D.

Whitnall's first lesson in anatomy, therefore, is before you start dissection, to set the living model before you, observe the sheen of health in the skin, its color, goose flesh or perspiration, the veins beneath it; then complete this study by examination of microscopic slides of its structure and glands, considering such minor features as may be present in the form of moles, corns, birth marks, blisters, freckles and wens.

MARVELOUS ARCHITECTURAL DESIGN

Likewise study the bones. They are not dead but actual living and gradually changing tissue. Every ridge and fossa and groove tells a definite functional story, as does their marvelous histologic architectural design. Furthermore, the bones hold a reserve of calcium phosphate and in their marrow they manufacture red blood corpuscles.

This fundamental principle that anatomic structure is determined by physiologic function is of universal application. The function shapes the form. The student should keep in mind in dissecting the dead that it is only a means of understanding the living. He must realize how different the tissues he dissects are from living tissues and how they will appear when he comes to see them in surgical operations, when everything will be mobile, elastic, fluid; arteries will pulsate and spurt when cut; veins will flow instead of collapsing, some lymphatics will be identifiable, muscles will be tractable; the peritoneum and pleura will be moist, glistening, active membranes; even the nerves will present a different appearance. He should think, therefore, of the living color and contour, remembering that cadavers are usually bodies of the aged who have died of disease and that perfect material cannot be expected in the dissecting room.

MICROSCOPIC ANATOMY

Now to correlate function with the gross anatomy, let us consider the microscopic anatomy. The mere difference in magnification is no excuse for relegating the fundamental details of the structure of organs to the secondary position in the student's studies which histology holds. To bridge the gap between the histologic slide and the dissecting knife the student can make frequent use in the dissecting room of the low-powered hand lens. To study the cut surfaces of organs, muscles, tendons, nerves and enlarged appearance of the intestinal villi the student will find an ever widening field of usefulness for the hand lens and yet he will see that the minute structure of organs as complex as the liver or the blood and the retina and the nerves cannot properly be understood without special preparation and examination under the microscope. It will be difficult to base the fundamental knowledge of the microscopic structure of organs on extremely thin, artificially colored and chemically treated pieces of them. He will have to translate a flat two dimensional picture into a solid three dimensional conception of the tissue as it actually exists. He must realize that the microscopic section also may

1. Whitnall, S. E.: *The Study of Anatomy*, Baltimore, Williams & Wilkins Company, 1939; price \$1.75.

be only one phase, like a snap shot as it were, of an ever changing design in the tissue he is studying, which varies with its functional activity and with age.

THINK EMBRYOLOGICALLY

To understand how the body has developed from the ovum to its adult form is as essential to the study of anatomy as to know the factors that govern the expansion of the community in which one lives. Indeed the human body is a community of cells which have gone through a specialization of labor comparable to the evolution of society from primitive man to urban life. In such a comparison the bones represent the engineers and builders; the cells of the alimentary tract may be compared to the cooks, waiters, dustmen and purveyors; the vascular system corresponds to the network of highways and streets, which throng with carriers of food, removers of waste products and special servants like policemen and detectives. The nervous system is comparable to a telephone exchange, forming a means of communication with the outer world; but especially to be admired in the healthy body is the perfectly balanced cooperation of all its systems and their devotion to the welfare of the whole community, a comparison which is unparalleled by an analogy.

The student should learn to think embryologically and, if he becomes a surgeon, to consider with astonishment nature's errors in her developmental operations. To understand such things as the bewildering foldings of the peritoneum or the obscure formation of the nasal air sinuses one must consider their early development and growth. In this way also one readily understands the cause of many congenital deformities and minor variations. You will be surprised later to learn how many medical conditions have as their base an arrest of development or a weakness in the process of development. Embryology will teach that each individual begins in the ovum with a certain potential of energy which, as development continues, is distributed among the various cells as they become differentiated into tissues and organs; that distribution of energy unfortunately is not always equitable, so that there result certain weak spots in our makeup through which we usually break down or where we are invaded by disease.

PRACTICAL METHODS OF STUDY

The most deplorable sight that can greet the teacher's eye is that of two students, one vociferously reading from a manual, the other unheedingly scratching away with a blunt scalpel; at intervals one will look at the number of pages that remain of his self-allotted score for the day, the other will glance at the clock. Both think they are studying anatomy. Whitnall advises them how to use the time more profitably.

Do not slavishly follow your books, expecting to find everything just as it is described, for there is no such thing as an anatomic "normal type." The student must compare the written statements with what he actually discovers and learns from seeing with his eyes. Textbooks are too often held sacred; many descriptions have been handed down through generations of books while their incorrectness is overlooked by thousands of patient dissectors. The most common position of the appendix, for example, was only recently established by statistics as retrocecal. Conduct your dissection, therefore, in a spirit of investigation and cultivate independent powers of observation and inquiry. It is a pernicious habit to ask for information on any question before bringing one's own judgment to bear on it. The gift of observation should receive its fullest cultivation in the anatomy department, and the student who sees only what is pointed out to him will be spoiled for the practice of medicine. Learn to think and decide for yourself; form the habit of making quick, not hasty decisions in small matters as preparations for great ones. In the second place, learn big things rather than details. Larger structures as a rule are more important than the small ones, yet this fact is constantly forgotten, possibly because big things are so obvious that they are overlooked. It is more useful to know that the cricothyroid ligament lies below the level of the vocal cords, where a foreign body might lodge, than to be able to write a detailed description of the arytenoid cartilages. The student's own judgment should enable him to realize the prime importance of studying things like the skull and to surmise that details of the various articulations of the cranial bones are unnecessary for future practice. Indeed, if a student is so fortunate as to be able to dissect the body twice, he should concentrate the first time on the big things. As a stranger in town you would naturally explore the main streets and buildings and later connect the minor ones with them. The connections of the hypothalamus are very important in the eyes of a Cushing, as is the complex nerve supply to the heart to a McKenzie, but those minutiae must not matter to the medical student being initiated into anatomy.

Do not depend on a mnemonic when you can reason out the facts from what is supplied. Why think of TAN to recall the relative positions of the biceps tendon, brachial artery and median nerve in the bend of the elbow when you already have marked them out in dissecting the upper arm? More will be gained by expending efforts in tracing the derivation and meaning of such words as cremaster, cricoid, ethmoid, glenoid, iris, pylorus, splenius, vomer, arytenoid and arachnoid, which, Whitnall says, mean respec-

tively "suspender, ringlike, sievelike, shallow, rainbow, gate keeper, bandage, ploughshare, ladle-like cobweb-like."

In the next place anatomy must be absorbed slowly. It cannot be retained at the first time of study but must be frequently revised, and for this purpose Johnston's Synopsis of Regional Anatomy, which is a review of what you must absolutely know, is recommended. When you come back for the next period of dissecting, go over everything you did the last time before you begin work again. You cannot possibly absorb in a short time even the main new facts which must be presented. It has been said that half of the new matter presented is forgotten in the first half hour, two thirds in nine hours, three fourths after six days and four fifths after a month—a devastating statement if universally applicable.

KEEP A STROP AT HAND

As soon as the student gets to actual dissection he should realize that one of the most useful things is to train the eye and hand in the dexterous use of instruments. He will be utterly void of any definite manual skill unless it is acquired by practice. Take pride in dissecting methodically to display the structures in their clearest outline. A good dissection should afford a student as much satisfaction as a good drawing. The scalpels must be sharp; use a large curved one for cutting tough skin, another for the main work, and a small straight blade for the finer dissection. Keep a strop at hand to whet the knives. When using the hone, keep the blade flat on it, not at an angle. For the rest you need only a pair of broad and easily closing, but perfectly meeting, forceps and your fingers, although sharp scissors, probes, chained hooks, needles and pins can at times be of assistance. Moisten the parts with water in dissecting away fascia, and at the end of a period of work carefully wrap up your dissection to preserve it properly. Devote more attention now to the exquisite care of your hands and nails, not only in preparation for the future patient, but to learn the preoperative surgical ritual. After making the dissection, the second and very important part is to study it. Therefore, rearrange the parts in their natural order and study the composition of the picture you have revealed, using every means to form a permanent mental impression, for anatomy is learned not by the ear alone but by the practicing eye and hand.

PRACTICAL SUGGESTIONS

Recite to some one or to yourself how you would describe what you see, following the dissection with your fingers. Next draw your dissection, for in no other way are the details impressed on the memory so accurately. Take

every opportunity to see other students' dissections to learn how structures vary. When operating on the living, you will not enjoy an extensive display of things as now, and so learn to identify a structure readily when it is only partly exposed or can only be felt. A good practice is to form window views by circumscribing with a torn sheet of paper or with the hands a restricted area of the finished dissection, especially one which includes a main artery. Learn to tell a muscle, tendon, vessel or nerve from its direction, relations and feeling.

SURFACE ANATOMY

Whitnall strongly emphasizes the value of knowing surface anatomy. Many a student first recognizes its importance only when brought to the bedside to find that the first thing he is faced with is the one that he has least considered. Learn to map out the anterior border of the lungs on the chest wall. From mere inspection of the surface form it is possible to tell the position and often the condition of many hidden parts.

CARDINAL RULES

Two cardinal rules of living anatomy are (1) Look before you feel, (2) examine both sides; in the case of injury to the shoulder, for example, it is well to examine the sound side first. Note the bones, which are the best landmarks, and learn where their prominences lie beneath the skin and can be felt. Make a thorough survey of the whole body on such lines, especially in the neighborhood of joints. It is more useful to verify that the posterior border of the ulna is just beneath the skin and can be felt in life throughout its whole length, and so is easily injured, than to be able to map the exact origins of the muscles on the back of the forearm. Consider how much of the base of the skull can be examined in life. Consider what the advantages and disadvantages are when vessels run on the flexor aspect of joints and in the provision of both deep and superficial sets of veins.

THE VISCERA

Now study the position of the viscera in relation to the surface of the body. Consider how posture affects the position and relations of organs. Reflect on the effect of gravity on the viscera, for "against gravity we fight in every movement of our limbs; it is the indomitable force that defeats us in the end, that lays us on our deathbed, that lowers us to the grave."

In studying surface anatomy, one can thus study the expression not merely of bodily processes but of personality. An obvious feature is the adenoid nose, slight frowning when reading may portray errors of refraction in the eye; malnutrition may be indicated by wrinkled skin

or gaunt eyes; a blank face may portray deafness. A slight drooping of the eyelid may indicate malaise or mental fatigue. Go a step further and deeply regard that the living body has a mind which will certainly be affected by ill health, by blood stream or by belief. Consider the reactions, in sorrow and sickness, of the mind—that is psychology, which bears the same relation to the mind that physiology does to the body.

SUMMARY

In summary: Know the body rather than the book; learn big things rather than details; anatomy must be absorbed slowly; dissect carefully and keep the knife sharp; then study your preparation; describe what you see; draw your dissection and see that of others; form window views, and study cross sections. End where you started from—the exterior—and *study surface anatomy*.

Correspondence

THE ADVISABILITY OF EXTRACURRICULAR ACTIVITIES IN THE MEDICAL SCHOOL

To the Editor:—The young man or woman in medical school is faced with many more difficulties than are enumerated in the curriculum. The plunge into study too often results in the student's losing contact with lay ideas. The newcomer to the profession finds his chosen field beset with the specters of an overcrowded profession, "patent medicine" therapeutics and a superpaternal attitude on the part of the government.

Efforts to remedy this situation by the individual medical student are highly laudable, but how much better this task could be done by a systematic, united pursuance of extracurricular activities by the entire student body at the medical school.

It behooves one to consider what types of expression the student can indulge in, never forgetting the danger of overzealousness and its disastrous effects on the primary aim of the school of medicine. The *raison d'être* of the medical student must be kept at a sufficiently high level to permit no conflict with the secondary indulgence in extracurricular activities. However, the medical school seems to have the situation well in hand as regards its purpose in the educational sphere. It was the late Dr. Harvey Cushing who said that no medical faculty ever permitted a free hour in the schedule because, like nature, it abhors a vacuum!

No attempt is made here to outline completely the possible streams of activity for the nonmedical trends of the student of medicine. This exposition may serve, however, to stimulate a more well rounded evaluation of the problem.

The following classification is divided into two principal subdivisions—the mental and the physical phases of extracurricular activity. Justification for the inclusion of the athletic scope of endeavor rests on a belief that medical students are sorely in need of organized and supervised exercise. The old aphorism of "mens sana in corpore sano" finds its greatest need in the student of medicine, whose hours of study are time consuming and permit of little physical activity.

SUGGESTED PLAN FOR EXTRACURRICULAR ACTIVITIES

Mental.—A. Theater Parties: Organized excursions to plays of proven merit or controversial themes. Groups will find theater managers amenable to quoting a cut rate for large parties.

B. Guest Speakers: On current topics and problems relating to the practice of medicine which are not considered in the school curriculum.

C. Musical Groups: 1. Attendance at recitals or concerts in organized groups. 2. Formation of performing groups, both vocal and orchestral. In this respect, the publicity recently given to the doctors' symphony orchestra in New York, while not within the scope of the individual medical school, indicates a worth while trend in extracurricular activity.

D. History of Medicine: Guest speakers or seminar reports. Even when a course on this subject is given at the school this activity will be found to be a valuable supplement to the curriculum.

E. Literary Groups: Discussions of the leading books of the day.

F. Chess and Checkers Club.

Physical.—A. Gymnasium Classes.

B. Softball: Interclass and interfraternity games.

C. Basketball: On same basis as softball games.

D. Hiking and Picnicking Groups: This when the environs make it possible.

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of Medicine, New Orleans.

The Average Medical Student

It has been charged by many that the average medical student leaves school with little power for growth. For years he is directed to a different room for every hour of the day, along with others, all in the hope that he may one day recognize a disease because he has seen it before. Then years later he stands much where he did at the time of graduation because those who taught him, or the course prepared for him to pursue, failed to remember that one day he must reason problems out for himself. Without the perpetual activity of a disciplined mind, he must fall victim to every passing fashion and must live among the credulous. He may trust neither his industry nor his capacity. New departures are presented and incorporated in his studies with bewildering haste, while with great reluctance much that he has learned slowly is swept away by discredit and disuse. The way of escape alone remains that we recognize in theory and practice that the young physician be trained not only in the observation of facts but also in the habits of handling them; in methods of reasoning which alone supply any solution to the problem of his professional life.—Black, B. W.: Community Aspects of Medicine, *J. A. M. Coll.* 13:19 (Jan.) 1938.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

"The Lad from Labrador"

Forty members of the senior class at the Long Island College of Medicine, Brooklyn, have been cast in a play entitled "The Lad from Labrador," by William Paddon, whose father Dr. Harry L. Paddon, until his recent death, had been the active head of the Grenfell Mission in Labrador. This play will be produced soon in the auditorium of the Brooklyn State Hospital. The forecast appears so promising that some members of the class have suggested putting on also some Broadway performances, as the Mask and Wig Club of the University of Pennsylvania do each year. Senior student Paddon, after finishing his training at St. Luke's Hospital, New York, expects to return to the Mission in Labrador to carry on where his father left off.

Harvard Awards Student Fellowships

Harvard University has announced the award of fourteen Harvard Medical School fellowships for the 1940-1941 academic year, totaling \$8,650; among others were the DeLamar Student Research Fellowship to William R. Christensen '42, of Salt Lake City; Henry S. Fuller '41, of Washington, D. C.; John W. Kirklin '42, of Rochester, Minn., and Irving M. London '43, of Malden, Mass.; also the Charles Eliot Ware Memorial Fellowship to Herbert R. Morgan '42, of Bell, Calif.; the George Cheyne Shattuck Memorial Fellowship to Thomas H. Weller '40, of Ann Arbor, Mich.; the John Ware Memorial Fellowship to Joseph M. Foley '41, of Dorchester, Mass.; also the James J. Cabot Fellowship to Hubert W. Smith '41, of Dallas, Texas, and the Dr. William Hunter Workman Fellowship to Nathaniel B. Kurnick '40, of Brooklyn.

Prizes at Temple University

Temple University School of Medicine, Philadelphia, has at least sixteen prizes of various kinds to be awarded to undergraduate students. The Faculty Prize, for example, is a gold medal awarded to the member of the graduating class attaining the highest average during the four years' course. The most recent award of this prize was to Henry T. Wycis, who also was awarded the Alumni Prize of \$25, the Rhinolaryngology Prize for passing the best examination in rhinolaryngology, and the Internal Medicine Prize for the highest combined average grade in the department of internal medicine for the junior and senior years. Among some of the other prizes available for awards are the Gynecology Prize, the Surgery Prize, the Urology Prize and similar prizes in various other departments.

"Information Please"

A contest between selected students of Rush Medical College and the University of Illinois College of Medicine in Chicago has been planned along the lines of the well known radio program "Information Please." The method of selecting the contestants from the University of Illinois College of Medicine, the *Illini Scope* announces, will as far as possible not be based merely on scholarship at the school "but also on worldly knowledge," and any student who feels himself qualified is requested to deposit his name in the "Scope" box in room 113.

Faculty-Student Luncheons

For three years the Medical Students' Club has sponsored faculty-student luncheons at New York Medical College and Flower-Fifth Avenue Hospitals, New York, at which once a week six first year students, six second year students and a faculty adviser for each of these two groups meet for lunch. The Medical Students' Club is a unit of the Intercollegiate Branch of the Y. M. C. A. and is responsible for making the arrangements of this social occasion, where students become acquainted with their fellow students as well as with members of their faculty. John F. Schlechter Jr., of the class of 1941, writes that these meetings are of much value, as they allow for a relationship between faculty and student that is difficult to arrange through other facilities, and contribute to the well-being of the college community.

Louisiana Students Serve Relief Patients

Louisiana State University School of Medicine in New Orleans has announced the establishment of a visiting medical service for teaching purposes in cooperation with the Department of Public Welfare of Orleans Parish. Students will supply the medical services to clients on relief, but they will be accompanied on every visit by an instructor. Calls for medical service will be relayed to one of three field instructors—Drs. Edgar Hull, Chester S. Fresh and Richard T. Stephenson—who in company with the medical student assigned to the case will see the patient. The director of the service, Dr. Hull, will visit acutely ill patients whose recovery seems delayed, and at intervals, the chronically ill patients. He will review each month the bedside notes and prescriptions issued to these patients. The school of medicine will supply consultants when needed and furnish the laboratory service.

Western Reserve Supplies Cleveland

Clevelanders are not generally cognizant of the fact that 43 per cent of its physicians were trained at Western Reserve University; also 73 per cent of its dentists, 38 per cent of its attorneys and 82 per cent of its pharmacists. They are too often unaware, also, of the fact that Western Reserve University is composed of thirteen colleges operating sixty-four buildings on 380 acres of land and that it instructs more than 11,000 students each year. A Western Reserve University alumni dinner is to be held at the Hotel Carter, May 8, to which the students as well as the faculty members and alumni and their wives and intimate friends have been invited to hear a speaker of national prominence. Among those on the committee arranging for the dinner is Harry D. Piercy '15, 10515 Carnegie Avenue, Cleveland. Like most other universities, the cost of instruction at Western Reserve University last year exceeded the income from student fees by \$15,559. For the present year there is an anticipated gap of about \$292,639 between the income from student fees, investments, sales of services, grants and the like and the cost of operating Western Reserve University. The university will hold an open house, Friday, April 12, from 2 to 11 p. m., during which time there will be exhibits, demonstrations and inspection of the buildings to which students, teachers, parents, alumni and friends are invited.

Award to Fourth Year Student

An annual award of \$50 has just been established by Mrs. George S. Bel as a memorial to her husband, the late Dr. Bel, who had been director of the department of medicine at Louisiana State University School of Medicine, New Orleans, for many years. In making the award, Mrs. Bel stipulated that it be presented to the fourth year medical student who symbolized the highest ideals of medicine; she listed as attributes which Dr. Bel had considered essential in the good physician "scientific interest, ethics, personality, tact, bedside manner, ability to handle people, kindness to patients, an aim to serve humanity rather than mercenary ambitions, and clinical ability." The winning student is to be selected from the ten highest ranking students in the fourth year class after they have been listed in order of preference by a representative committee of the general faculty, headed by the dean of the school and chairman of the executive committee. The award will be presented for the first time at the end of the current school session.

The Oldest Medical School in America

The University of Pennsylvania, Philadelphia, celebrates its two hundredth anniversary in 1940. In recognition of this event, the students of the medical school have published a volume in the form of their annual yearbook, which contains histories of the Pennsylvania Hospital and the Philadelphia General Hospital and of the university itself. They have also reconstructed the history of the medical school by the individual departments, illustrated with scenes taken in the laboratories, classrooms and wards. They have included the history of each medical fraternity and society, with brief accounts of the Philadelphia College of Physicians and of the Henry Phipps Institute. The University of Pennsylvania School of Medicine, founded by Drs. John Morgan and William Shippen in 1765, is the oldest medical school in America. Closely related to this institution are the two oldest hospitals in America, the Pennsylvania Hospital, founded in 1751, and the Philadelphia General Hospital, which began as an infirmary to the Almhouse in 1731. In the wards of these two hospitals, as well as in the University Hospital, the students at this school get their training.

Tea at the Dean's Home

Dr. Jean A. Curran, dean of the Long Island College of Medicine, Brooklyn, and Mrs. Curran continue to entertain the underclassmen at informal teas at their home. The entire sophomore class, who had been entertained in groups in their freshman year, had a reunion at the dean's residence recently, and since then small groups of the freshman class have been invited on Friday afternoons for coffee and doughnuts and a chance to talk with members of the faculty who drop in on these informal occasions.

Books for Medical Students

In the book review columns in this issue of THE JOURNAL, beginning on page 1103, are several reviews of books which appear to be especially useful for medical students. These books are:

Human Histology: A Guide for Medical Students. By E. R. A. Cooper.

The Tissues of the Body: An Introduction to the Study of Anatomy. By W. E. LeGros Clark.

Handbook of Bacteriology for Students and Practitioners of Medicine. By Joseph W. Bigger.

A Laboratory Guide to Microscopic Anatomy with Directions for Laboratory Studies in Cytology, Histology, Organology, and Embryology. By Rafael Hernandez.

Outline of Physiology. By William R. Amberson.

An Introduction to Human Anatomy. By Clyde Marshall.

A Synopsis of Regional Anatomy. By T. B. Johnston.

Synopsis of Pediatrics. By John Zahorsky.

Annual Meeting of Honorary Society

The third annual meeting of Tufts College Medical Honorary Society was held January 17 at the University Club, Boston, when the annual prize of \$100 for being most proficient in his studies at the completion of the third year term was presented to senior student Stanley L. Robbins. The selection of the winner is made by the medical faculty and the scholarship committee of the honorary society. The presentation was made by Dr. Louis Feldman. Dr. William Osler Abbott, Philadelphia, lectured on "Intestinal Indigestion and Its Differential Diagnosis." The toastmaster was Dr. Frederick W. O'Brien, professor of radiology. The Executive Board of the honorary society sponsored a postgraduate clinic in the Pratt Diagnostic Hospital at the New England Medical Center. Tufts College Honorary Medical Society, organized Sept. 4, 1938, aims to stimulate high scholastic standing and greater interest in research, to establish a scholastic fund and to give honorary recognition to prominent Tufts graduates.

Duke University

A department of psychiatry and mental hygiene has been established at Duke University School of Medicine, Durham, N. C., through the generosity of the Rockefeller Foundation, which granted \$175,000 for this purpose. The new department will begin operating September 1 under the direction of Dr. Richard S. Lyman, now of the Phipps Psychiatric Clinic, Johns Hopkins University.—The following clinics for students were held recently: Dr. Samuel A. Vest Jr., professor of urology, Medical College of Virginia, Richmond, on "Testosterone Therapy in Hypogenitalism"; Dr. John M. T. Finney Jr., associate in surgery at Johns Hopkins University School of Medicine, on "Appendicitis," and Dr. Thomas Francis Jr., professor of Hospital Medical College, New

Prize for Interns and Residents

Interns, residents, graduate students in obstetrics, abdominal surgery, and physicians or teaching those subjects are eligible for the annual Foundation Prize of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, which this year amounts to \$150. The prize-winning thesis must be presented at the next annual meeting of this association in September without expense to the association and in conformity with its regulations. Manuscripts must be presented in triplicate and be triple spaced on one side of the paper, under a non-de-plume, to the secretary of the association, Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va., before June 1. Manuscripts are limited to 5,000 words and sufficient illustrations necessary for a clear exposition of the thesis.

Award of Henry A. Christian Prize

Harvard University announced, February 16, the award of the Henry Asbury Christian Prize to John G. Scannell '40, of Jamaica Plain, Mass. The prize, one of the important honors of the medical school, is awarded to "the student in the fourth year class who has displayed diligence and notable scholarship and offers promise for the future."

Mr. Scannell graduated from Harvard College with honors in history in 1936; as an undergraduate he was manager of the swimming team, editor of the *Harvard Lampoon*, editor of the *Freshman Redbook* and a member of the Speakers' Club. At the medical school he is a member of the Lancet Club, of Alpha

Omega Alpha, honorary society in medicine, and of the Boylston Medical Society. He is the son of Dr. David D. Scannell, honor graduate from Harvard College in 1897 and from Harvard Medical School in 1900.

Lectures to Michigan Students

Dr. Francis G. Benedict, formerly director of the nutrition laboratory of Carnegie Institute, addressed the students of the University of Michigan Medical School, February 21, on "The Future of Basal Metabolism." The students of this school were also addressed by Dr. Malcolm T. MacEachern, Chicago, associate director of the American College of Surgeons, on "The Role of the Hospital in Graduate Education for the Physician or Surgeon Desirous of Proper Preparation for His Specialty."—The students of the University of Michigan Medical School, Ann Arbor, and the dietetic staff of the University Hospital were addressed, February 12, by Dr. John W. Riegel, professor of industrial relations and director of the bureau of industrial relations of the University of Michigan, on "Personnel Relationships."

Prizes Awarded at Columbia

Donald G. Anderson, class of 1939, was awarded the Janeway Prize at Columbia University College of Physicians and Surgeons, New York, which is given to the member of the graduating class ranking highest in efficiency and ability. The William Perry Watson Prize, awarded for outstanding work in the study of diseases of children, was awarded to Henry D. Janowitz. The Thomas F. Cock Prize, for a thesis on "Puerperal Morbidity in Relation to Certain Methods of Induction of Labor," was awarded to Harold G. Bergen. Stanley I. Glickman of the second year class was awarded the Harold Lee Meierhof award for "conspicuous effort in pathology."

Expenses at the University of Virginia

The fees for instruction at the University of Virginia Department of Medicine, Charlottesville, for the first year are: tuition fee (Virginians) \$310, (non-Virginians) \$360; library fee \$20, health service fee \$15; athletic fee \$15; college topics fee \$1.50, and laboratory fees in various departments, making a total for the fees of instruction for a year for Virginians \$414, and for non-Virginians \$464. In addition, the minimum for necessary living expenses, including room, heat, light, furniture, board and laundry, is estimated at \$400.

Medical College of Virginia

As a part of the program of expansion of the course in industrial health in the Medical College of Virginia, Richmond, Dr. G. H. Ghermann, medical director of the E. I. DuPont de Nemours Company, and Dr. John H. Foulger, director of the Haskell Laboratory of Industrial Toxicology of the DuPont Company, have been appointed associate professors of industrial health to give special lectures. The initial lecture of a lectureship recently established by Phi Beta Pi medical fraternity at the Medical College of Virginia was given by L. B. Arey, Ph.D., of Northwestern University Medical School, Chicago, March 16, on "Wound Healing."

New York Seniors Meet with Alumni

An informal meeting has been arranged for April 5 between members of the senior class of the New York University College of Medicine and a group of alumni representing the faculty and the alumni association. The purpose of the meeting will be to acquaint

the senior class with the activities of the association and to discuss their participation in this work after graduation. Dean Currier McEwen '26 will speak for the faculty, Dr. James W. Smith '17, as president of the alumni association, Dr. George G. Ornstein '15, as vice chairman of the Alumni Fund Committee, and Mr. George C. Beekman, as president of the senior class. Dr. Nathan B. Van Elten '90, President-Elect of the American Medical Association, has been invited to the meeting.

Policy of Association of Medical Students

At the fourth National Convention of the Association of Medical Students in Detroit last December, the following permanent policy of the Association of Medical Students was adopted:

"Objects: This association shall concern itself with the ethical, social, humanistic, and, educational aspects of medicine, in order that its members may be better equipped to serve themselves, their profession, and society."

(Constitution, Art. 1, Sec. 2.)

"... To serve themselves ..."

Since the Association of Medical Students lives and grows best where it sends down deep roots of service into the lives of medical students, it achieves its highest purpose as a service organization, by:

- (1) enriching their educational and cultural life;
- (2) protecting student health, through aiding in the establishment of adequate health services, housing and eating facilities, and social and recreational opportunities;
- (3) working toward the adoption of a uniform date of internship appointment, standardization of internship examinations, adequate remuneration for interns, and, compensation in case of sickness or injury;
- (4) aiding in the establishment of scholarships, student loan funds, and other methods of meeting the problem of the tremendous cost of medical education; and by
- (5) fostering a closer understanding between faculty and students.

"... To serve ... their profession ..."

By helping in the maintenance of high standards of medical practice, through:

- (1) hearty support of the organized profession and of medical educators in their well known efforts to continue to raise the standards of medical schools;
- (2) intelligent cooperation with the faculty in dealing with the problems of the curriculum;
- (3) aiding in every way possible the constant endeavor of the medical profession to maintain its reputation for fairness and scientific accuracy and to preserve the unity within its ranks; and
- (4) working towards the establishment of equal opportunities for members and prospective members of the profession solely on the basis of individual merit, in accord with the fundamental American principles of democracy and freedom of opportunity, without regard for race, creed, sex, marital status, or other considerations.

"... To serve ... society ..."

Recognizing that the health of its people is the nation's greatest resource, and, that it is the right of all individuals to receive the best that medical science has to offer, the A. M. S. is dedicated to the raising of the level of the general health of the nation by cooperating with and urging the medical profession and recognized public agencies to take the lead in determining the nature and direction of programs—both legislative and educational—most in keeping with the best interests of the public and profession, and designed:

- (1) to provide more nearly adequate medical care for all the people and extend the services of public health and preventive medicine;
- (2) to effect the exposure and ultimate annihilation of such serious threats to the scientific practice of medicine and of such menaces to the health of the nation as the propaganda of quacks, pseudo-medical cults and anti-vivisectionist movement, the policies of unscrupulous patent medicine manufacturers, unethical pharmaceutical and surgical supply houses; and
- (3) to acquaint the lay public with its potential role in raising the level of the general health of the nation.

"... Firm stand ... for peace ..."

Recognizing that war is inimical to the ideals of our profession because it destroys and dishonors life, increases human suffering and stifles science and culture, and that any local or national program embarked on by the A. M. S. is secondary to and dependent on the preservation of peace and democracy, just as is medical practice and research in general, the A. M. S. takes a firm stand for the establishment and preservation of peace.

Lectures to Upper Classmen

The junior and senior classes of both Louisiana State University School of Medicine and Tulane University of Louisiana School of Medicine met in the Tulane Auditorium at Hutchinson Memorial, February 27, to be addressed by Dr. Eldridge L. Eliason, professor of surgery at the University of Pennsylvania School of Medicine, on "The Patient and His Fracture." On the previous day, February 26, the juniors and seniors of Louisiana State University School of Medicine met at the New Charity Hospital to be addressed by Dr. William J. Dieckmann, associate professor of obstetrics and gynecology, University of Chicago, on "Toxemias of Pregnancy." The speakers on these occasions were introduced respectively by Dr. Urban Maes, professor of surgery, and Dr. Philips J. Carter, professor of obstetrics and gynecology at Louisiana State University School of Medicine.

College of Medical Evangelists

The dean of the Loma-Linda Division of the College of Medical Evangelists has reported a total of 409 students enrolled in the medical school, including seventy-five freshmen, representing twenty-three states, the District of Columbia, Hawaii and eight foreign countries. The most important improvement in the last year has been the new physiology building. It is planned to build a new men's dormitory, replacing the hospital building which now houses male students. Recreation facilities for the students have been grouped together across Stewart Street to the north from the campus. Some of the needs which the dean mentioned are additional teachers, and dispensary and library facilities.

Scholarship for Jewish Student

Applications are being received at the University of Illinois College of Medicine, Chicago, for the Theodore B. Schnitzer Memorial Scholarship of \$100, which is awarded each year to some Jewish student who has completed at least one year's work in the college of medicine and who is in the upper scholastic half of his class and is needy. Application blanks may be secured at the administration office of the college of medicine.

Medals and Prizes at Georgetown University

Following are some of the awards made at Georgetown University School of Medicine, Washington, D. C.:

The Baker Memorial Medal. To a student who has achieved the highest record in anatomy, a gold medal is awarded annually.

The Kober Medal in Hygiene. A gold medal is awarded each year to a member of the senior class who has attained the highest average in the course in hygiene and whose record in his other studies is creditable.

The Hird Prize in Physiological Chemistry. A prize of \$35 is awarded to the student who achieves the highest grade in physiologic chemistry.

Physiologic chemistry prizes. An award of \$25 and one of \$15 will be made to the two members of the first year class who achieve, respectively, the second and third highest grades in physiologic chemistry.

The Ewing and MacCallum Prizes in Pathology. These prizes are awarded annually to the two students receiving the highest grades in pathology.

Scholarships at Howard University College of Medicine

Following are some of the scholarships available at Howard University College of Medicine, Washington, D. C.:

The George B. Cabaniss Medical Scholarship. Awarded annually on a basis of good scholarship and of need.

The John R. Francis Medical Scholarship. Awarded annually on a basis of good scholarship and of need.

University scholarships are awarded in amounts varying from \$125 to \$250. Each is made annually to a medical student who has maintained a high average scholarship and who is in need of financial aid.

Chemist Lectures at Tulane

Dr. Samuel C. Lind, president of the American Chemical Society, editor of the *Journal of Physical Chemistry* and director of the chemical laboratories at the University of Minnesota, addressed the students at Tulane University, New Orleans, January 31, on "Radium, Its Production, Uses and Dangers." The lecture was preceded by a dinner and was followed by an informal reception attended by members of the faculty and others.

Scholarships at Syracuse University

Following are some of the scholarships open to students at Syracuse University College of Medicine, Syracuse, N. Y.:

The Dr. Menzo W. Herriman Scholarship is awarded annually to the senior deemed most deserving of financial aid, selected from among the five students highest in rank at the end of the junior year.

The Dr. John L. Heffron Scholarship is awarded annually to the senior whose work during the three previous years has shown him to have a special aptitude for medicine.

The Clara L. Groff Scholarship is awarded annually to a deserving student with limited financial resources.

The local chapter of Alpha Omega Alpha annually awards a scholarship to a senior student who is selected by the officers of the local chapter on the basis of accomplishment and promise. An annual prize is also offered by this chapter to the senior or junior who presents the best paper on a medical subject involving original observation.

Fifty-Three Harvard Students Receive Awards

Harvard University announced October 1 that awards totaling \$18,890 had been made to fifty-three students in the Harvard University Medical School, Boston, for the current academic year.

Medical College of Virginia

Exercises for the opening of the one hundred and second session of the Medical College of Virginia were held at the Old First Baptist Church, Richmond, September 18. The principal address was given by Col. E. W. Clark, acting commissioner of public works of the Public Works Administration, following which the cornerstone was laid for the new \$2,000,000 hospital. The enrolment at the Medical College of Virginia for the current year is 303 in medicine, 139 in dentistry, 112 in pharmacy and 141 in nursing, a total of 695. The Public Works Administration has approved a supplemental grant amounting to \$123,056 for the new hospital.

Prizes Awarded at Washington University

At the recent annual commencement of Washington University School of Medicine, St. Louis, final honors at the school were awarded to Joseph Borenstine, Harry B. Campbell, Charles L. Eckert, Leo J. Geppert, Robert M. Hardaway III, Herman F. Inderlied, Darwin W. Neubauer, Edward H. Reinhard, Robert E. Shank, Arnold DeM. Welch and Ernest Zander.

Charles B. Mueller, '42, was awarded the George F. Gill Prize in Anatomy; Charles R. Anderson, '39, the George F. Gill Prize in Pediatrics, and Darwin W. Neubauer, '39, the Alpha Omega Alpha Book Prize.

The following students were awarded various scholarships: Roy E. Ahrens Jr., William M. Anderson, Parker R. Beamer, Grace Bernger, Frank A. Brown Jr., Edward Dunn, Jane Erganian, Sam Gollub, Charles M. Huguley, Leon Kahn, Gordon S. Letterman, Sam Levy, Frances Love, Allyn McDowell, Kent McQueen, Charles R. Mueller, James A. Read, William G. Reese, Helen Reller, Ernest Rouse, Llewellyn Sale Jr., Philip T. Shahan, Vergil Slee, Earl Sutherland, Gordon Todd, Souther Tompkins and Martin S. Withers.

Equipment Required at Minnesota

Each medical student at the University of Minnesota Medical School, Minneapolis, must be provided throughout the entire four year course with a microscope of approved quality and equipment. For the junior and senior years each student is required to provide himself with a hemocytometer, a head mirror and a stethoscope of approved form.

William Harvey Society

The William Harvey Society, which is one of the activities to which the Student Activity Plan at Tufts College Medical School, Boston, gives counsel and financial aid, met February 9, at Beth-Israel Hospital, Boston, when Dr. Alfred N. Richards, professor of pharmacology, University of Pennsylvania School of Medicine, Philadelphia, spoke on "Kidney Function." A previous meeting of this society was held January 12, when Dr. Stanhope Bayne-Jones gave an address on "The Relation of Viruses to Cancer—A Review."

Annual Prize for Interns

The Massachusetts Medical Society has offered a \$50 prize for the best written and most comprehensive case report submitted by one of their number holding an internship in any Massachusetts hospital approved by the American Medical Association for intern training during 1938-1940. The typewritten case report must be sealed, unsigned, in a plain envelope which in turn is to be placed, together with a separate slip bearing the name and address of the contestant, in a larger envelope and sent to the Committee on Medical Education and Medical Diplomas, Massachusetts Medical Society, 7 Fenway, Boston. Reports may be submitted at any time prior to May 5.

Lecture to Juniors and Seniors

The junior and senior classes of Louisiana State University School of Medicine, New Orleans, were addressed, January 20, by Dr. J. Deryl Hart, professor of surgery at Duke University School of Medicine, Durham, N. C., on the clinical and pathologic features of benign neoplasms of the parathyroid glands. Dr. Hart was presented to the assembly by Dr. Urban Maes, director of the department of surgery.

London Medical Students and the War

According to the *British Medical Journal*, February 17, there is a greater concentration of students now in London than was the case a few months ago. A complete resumption of the normal program at the hospitals in London is not possible so long as hospitals are compelled to reserve one third of their beds for civilian casualties, for the remaining beds would not be sufficient in all cases to provide clinical material for the students who would normally be in attendance. For example, at the University College Hospital the arrangements for the summer term depend on whether further beds are opened at the center; if they are not opened the new entry of clerks and dressers will be taught at the periphery, at what used to be Leavesden Mental Hospital, and will come into the center for their second and third clinical years. The October entry of University College Hospital students went to Cardiff and will stay there until they come back to London next October for their second year. The London School of Medicine for Women has 163 clinical students working in London and only nineteen at its two associated hospitals in Hertfordshire; but at one of those country hospitals it is expected that many more beds will be open in the future, and in that case it is more likely that a larger proportion of students

will be working there instead of in Gray's Inn Road. The preclinical students of the metropolitan schools are for the most part remaining in the provinces, though the Middlesex contingent has returned to London from Bristol. But a strong intention is expressed in several quarters to have the preclinical students back for the next autumn term unless, of course, air raids on London develop on such a scale as to make that course inadvisable. In general, as the outpatient and other services resume their normal aspect, the dispersive movement will be reversed.

At St. Bartholomew's, the students who were originally living in small outlying hospitals have all been drawn into three hospitals, the biggest proportion being at Bart's itself. While the students have their teaching spread out under a greater number of teachers, the arrangement has the advantage that some of the teachers are actually living in the outlying hospitals, so that there is much closer contact between them and the students than in peace time. On the other hand, the transfer of a number of consultants in the Emergency Medical Service from whole time to part time engagements has reinforced the teaching staffs available in London.

Bart's is not running any teams as it does in peace time, but the London Hospital is reestablishing the medical professorial unit, and there are to be three medical teams each under the charge of two honorary physicians, and three surgical teams each under two honorary surgeons; also the aural team, the cardiac department, with beds, and the department of obstetrics and gynecology. The outpatient departments and clinics, including the maternity district of the London Hospital, are nearly at their prewar level. Junior clinical students will spend their first twelve months in the hospital, working for six months in the wards and then three months in the special departments, after which they will take a course in pathology, the teaching of which has been centralized at the parent institution. After instruction in anesthetics and in obstetrics and gynecology it is considered that they will be senior enough to be attached for six months to one of the associated municipal hospitals, afterward returning to the London Hospital to attend the outpatient departments and for revision work preparatory to their finals.

The statement of the position at the metropolitan schools illustrates the tendencies, now that the effects of the dispersion are wearing off. Some of the deans, while alive to the disadvantages of having their staffs and students scattered over the breadth of whole counties, feel that much has been gained by the experience and that a certain distribution of students for varying periods over other hospitals in the sector might well form a permanent feature of medical training. One also gathers that, so far as can be foreseen, the entry for next year will be up to the level of last.

Wisconsin Questions in Neurology

The following questions in neurology were given at the examination held in Milwaukee June 27-30, 1939, by the Wisconsin State Board of Medical Examiners: (Answer three)

1. What involvement of the nervous system is most commonly associated with pernicious anemia? What are the signs, symptoms and differential diagnostic features?
2. Name the common causes of peripheral neuritis. Describe the symptoms, physical signs and course of a typical example.
3. A young woman who had always been well except for an attack of chorea in childhood, but who recently had noticed some palpitation and irregularity of the heart and some dyspnea on exertion, awoke one morning to find herself unable to speak or to move her right arm and leg. Within a few hours the speech had returned and by the next day she could move the affected arm and leg. Discuss in detail the cause of the attack of hemiplegia and the sequence of events leading up to it.
4. Spastic paraplegia in a child 3 years of age; give etiology, pathology, treatment and prognosis.

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ADDENDA TO THE AGENDA FOR THE DECADE 1940-1950

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NEW YORK

My purpose in this paper is to offer an inventory of special opportunities for development in medicine in the decade now before us—a decade that will see us half through the twentieth century. It is an inventory more commonly of what is lacking than of what is insufficient, a list of what could sensibly be added rather than a mere notation of what exists inadequately.

We face ten years of considerable importance to medicine in America and in the world generally. The years from 1940 to 1950 will witness not only the effects of reduction of income from existing endowment but also a considerable change in leadership. In most parts of the country the refunding of substantial blocks of securities held as endowment for medical education is imposing reductions of from 15 to 35 per cent of the most effective income of the medical schools, and at the same time the budgets of most of the voluntary hospitals are undergoing similar retrenchment and apparently inevitable reduction. Peculiar to the coming decade there will be a proportion of retirements of full or head professors which is far larger than for the decade 1930-1940. It will therefore be a time in which the search for new men and new money will be, and must be, unusually earnest and intense.

The temptation under such conditions will be to concentrate all efforts on merely holding the advantages secured from 1910 to 1930—a natural effort and a praiseworthy one. It is said that generals prepare to fight the last war over again, never to fight the new war to come. If, as existing income for medical schools diminishes, the number of new foundations in America is rapidly increasing, then we have a new set of conditions to meet and it may wisely be the duty of medical school administrators to consider and to list the opportunities in medicine: the deficiencies, the needs, the openings, not merely in terms of repair, replacement and restitution, but in terms of what a well rounded medical education should be.

It has been my observation that the duties of a dean are of four principal sorts: He must secure the acceptance of plans which are imaginative, complete and consistent; he must bring tenacity and continuity to the realization of such plans; he must hold himself responsible for the balance and the quality of the whole course offered to the student, and he must adjust his school to

the social, financial, professional and administrative milieus in which it exists.

It is to the first of these duties—that of planning—that this paper is directed, since it is probable, if not certain, that in the coming decade financial anxieties and the desire to recapture lost functions and lost income will eclipse the duty of being also aware of fields heretofore neglected or never developed. My thesis is that now is the time to make an inventory of a few of the defects of medical education in America so that we may be ready and fully aware of them, since medical education will need support urgently in the decade from 1940 to 1950, and a full list of its needs is a more effective argument than a mere request for restitution of earlier activities and points of view.

First among the needs of American medical schools is likely to be one for well supported departments of medicine. The department of medicine is the keystone of the clinical arch and the principal factor in the professional training of the students. Any new foundation or any local benefactor could hardly invest new funds more wisely for the excellence of the school as a whole than in strengthening the department of medicine. I want that clear and uppermost, since otherwise some of the subsequent suggestions might seem to be supplements inexcusably in disregard of the essential. They are not so intended, but rather as comments designed to show wherein American medicine could wisely be filled in, rounded out or made more complete. They are in many ways what could be offered to a donor's inquiry "Where could some funds be applied, almost for the first time, to make a distinctive, single and lasting contribution to medical education in North America?"

Let us list some of the aspects of medical education which at present are inadequate—inadequately supported, inadequately esteemed, inadequately related to the rest of the course. In the first place I would put the subject known as social medicine, public medical service or medical economics. Our students need and want some orientation in that field, which is not only widely and actively discussed but in a ferment of practical adjustment. It is not in the tradition of higher education to evade discussion. Nor is it an answer to say "What is there to teach?" Some of the finest teaching can take place when there is much to discover and but little as yet to indoctrinate. I venture to say that the order in which medical schools in this country organize seminars and courses on social medicine will be a serial register of the relative alertness of their administrations. Why do we go so far afield as to talk of ostriches when genus *Homo* is so apt an example of self-deluding aversion to reality? The practice of medicine always takes place in institutions; not all of it, but much of it; and there will be more of it in the next decade

than formerly. Can schools afford to set the example of ignoring so cogent a fact? What discussion takes place in your school on public or organized medical care: how to protect its quality, how to provide continuity of care and how to control its cost?

Next comes the status of pharmacology in American medical education. Relative to the value of therapeutic discoveries in the past thirty years, and relative to the potentialities of chemotherapy, and relative to the size of the drug industry in the United States, the support and esteem "enjoyed" by pharmacology in the medical curriculum is absurd. And the scarcity today of pharmacologists qualified for teaching posts, governmental appointments or industrial positions is lamentable—or exciting, if you don't think it is too late. Here is a subject for a whole series of papers,¹ and study of a large number of personal communications I have elicited convinces me that it is high time that American medical schools increase their attention to pharmacology *in esse* and *in posse*.

It would do no harm for most universities to set up committees to explore, define and effectuate a policy by which the resources of the university in chemistry, biology, pharmacology and clinical medicine could be brought to bear on finding what chemical substances do to living tissue. Most of the evidence I have received suggests that pharmacology is about in the position of a large family billeted in too small a house: the different members or parts of pharmacology are crowded together, callers don't always find just whom they expected to be at home, the longer such residence is maintained the greater the restlessness of the inmates, and sooner or later the house is deserted or is occupied by a sole survivor too complacent or too bitterly resigned to trouble the landlord. Pharmacology properly developing cannot resign itself to being a mere preclinical subject, or for that matter a mere therapeutic discipline limited to alleviation of human symptoms. As the science of the action of chemicals on living organisms it extends into the diagnosis, prevention and cure of disease, plant and animal, and into the lethal, inhibitory and stimulative effects on various kinds of living tissue. It should be separate and in its own right articulated with physiology and biochemistry, not ankylosed or encysted. Though practical considerations will usually place pharmacology in medical schools, it could be treated more wisely as a guest than an underpaid in-servant eking out an existence from relations with manufacturers. And incidentally, until it receives more generous treatment from the universities, pharmacology will exhibit a strange confusion of fear and friendliness, impetuosity and inhibition, dependence and false pride in its relations with even the best commercial people, who on their side could contribute much of value if the circumstances were less confused. Though financial support for pharmacology is important, reflection, discussion and clearly defined reorganization are essential; that is the dean's job and the faculty's responsibility.

Third on this list is dermatology. In many American medical schools the budgetary support for dermatology is farcical. Granted that the impression is common that dermatology is mostly meticulous description plus empirical and traditional therapy, is it in any sense wise

to fall in with this error and therefore deny a considerable number of beds and the contributions of histology, physiology, biochemistry, pathology, bacteriology, psychiatry and internal medicine to the dermatologists? The usual skimping of scientific resources and collaboration for the dermatologists presents the classic picture of deliberate neglect in that the chief losers are probably not the dermatologists but medicine as a whole. It is exactly from neglected fields that we may expect our most significant advances.

Legal medicine is a field in which there is sharp contrast between the standards and accomplishments of European medical schools and our own. The same people who ignore social medicine and the effect of the way medicine is practiced on the practitioner will tell you there is no developing legal medicine until the coroner system is abolished. Very likely they also are devoted to reading murder mysteries but are without any effective regrets over the innumerable injustices and futilities of criminal justice in these United States. The indifference in most medical schools to the subject of legal medicine, and consequently its inadequate development, would deserve your attention for the coming decade. Change will not come from the coroners, as a rule, and our police forces have long ago proceeded without benefit of what medicine is providing police officers in Europe.

A curious phenomenon in American medicine is the debt elimination of much reference to physical therapy. Almost as those who keep their children ignorant of the facts of life, we appear to protect the American medical student from the knowledge of physical therapy, mindful, I suppose, of the abuses imputed to osteopaths and chiropractors. Of course there is much the same result: thus protected, our graduates angrily complain of competition from those whose knowledge it is tabu to acquire. Cornford comments on propaganda as the art of lying in such a way that you very nearly deceive your friends without quite deceiving your enemies. That reminds me of the way physical therapy is propagated in this country. But the effects of heat on capillary circulation, lymph flow and inflammation, and the indications and effects of massage and passive movement or of irradiation, can certainly be learned and taught as physiology without any trace of charlatanism. The current unabashed ignorance of physical therapy in this country leaves it as an excellent opportunity for development in American medicine.

Of course a much more inclusive and significant development, in which physical therapy would be but a small part, would be the recognition of biophysics on a basis similar to that of biochemistry. True, it would belong close to physiology and at first it would derive from physiology as did biochemistry. Indeed at the present time the application of methods of electrical stimulation, record and measurement dominates the research interests of so many American physiologists that biophysics removed from physiology would leave something of a vacuole. As in most of the preceding suggestions, I argue here for the explicit acknowledgment of insidious reality: physics is applied to medicine, physics is required for entrance to medical school, and yet deliberate recognition or energetic development of the potentialities of biophysics is left as the responsibility of no one in particular, leading a grant-in-aid existence until its value as a companion piece of biochemistry is finally admitted.

1. Edmunds, C. W.: The Teaching of Pharmacology, *J. A. Am. M. Coll.* 11: 83 (March) 1936. Leake, Chauncey D.: Prolegomenon to Current Pharmacology, Univ. California Publ. Pharmacol., 1: 1-30 (No. 1) 1938. Lamsen, P. D.: Suggested Revisions of Medical Pharmacology, *Ann. Int. Med.* 12: 161 (July) 1939. Marshall, E. K.: An Unfortunate Situation in the Field of Bacterial Chemotherapy, *J. A. M. A.* 112: 352 (Jan. 28) 1939.

Experience has shown the wisdom of going to the natural sciences for the elucidation of disease. It is early, but hardly too early, to begin the exploration of the field of genetics in the study of human disease and human physiology. As a mathematician versed in statistics has proved a helpful consultant to the teacher of public health, so a competent geneticist from the department of biology, with a consultant's status and the duties of a lecturer, could quicken the future physician's curiosity about susceptibility to disease and thus have a share later in the intelligent collection and critical examination of patients' histories in points hitherto ignored or, worse, superficially and mechanically disposed of.

Another subject for which some argument may be needed is the history of medicine. It is not a subject likely to carry much of a message to the immature mind. Students assume, often until the end of the internship, that it is the opinion of them held by doctors that matters. Then suddenly and bewilderingly it is the layman's opinion that comes into play. Perhaps some inkling of the orientation of the medical profession in time and in society would help. But I suspect that the medical historian's principal value is in helping the teaching staff to understand their relation to their fellows in other fields, to recognize their opportunities and see their freedom as investigators, to enjoy their work in the framework of its previous growth. It is certain that as specialization continues to narrow our horizons and limit our experience, we must forcefully cultivate understanding of the meaning of those other disciplines on which we increasingly depend. Novel as the suggestion may seem, some effort must be made to refresh and inform the teachers as well as the students in a well balanced medical school. It is not the past that matters, but the fullest possible understanding of that moment in history which we call the present. Witness the interest of the masters of medicine in its history if you hold the history of medicine to be a meaningless ornament to a school.

Here then are fields to make ready for occupancy—two or three, at least, in the next decade. I have not belabored you with subjects for which adequate recruitment and continued support are all that is needed. I have not exhausted all the additional subjects that might be helpful, nor have I mentioned fields in which most needed growth and emphasis are already taking place. I have given, rather, a list of subjects in American medicine which I would gladly see discussed and developed further out of their present certain confusion, general neglect and apparent disesteem.

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Prevention of Altitude Sickness.—The prevention of altitude sickness may be accomplished in several ways. Obviously it will not occur if flights are carried out at altitudes below which symptoms do not appear. Where flights above those altitudes are desirable or necessary, altitude sickness can be prevented by increasing the partial pressure of the oxygen in the inspired air. The simplest means of accomplishing this is by raising the percentage of the oxygen in the inspired air by the inhalation of breathing oxygen. The second method is by enclosing the personnel in a pressure tight compartment in the airplane and maintaining a pressure near one atmosphere therein. The third method is a combination of the other two where a high percentage of oxygen and an increased atmospheric pressure both are maintained in a pressure tight compartment such that the partial pressure of the contained oxygen is near its sea level value.—Armstrong, Harry G.: *Principles and Practice of Aviation Medicine*, Baltimore, Williams & Wilkins Company, 1939.

PROGRESS IN GRADUATE MEDICAL EDUCATION

REPORT OF THE CHAIRMAN OF THE COUNCIL
ON MEDICAL EDUCATION AND HOSPITALS

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The practice of medicine is a continuous process of education. The doctor who stops learning goes backward, even though he may be growing older and making motions that go with the care of the sick. Medicine is so avid for advance, so eager for new ways that are better to help the ailing or to stop suffering and pain, that those who practice it must be alert to research, must confer with their fellow physicians through societies and literature, and from time to time travel to see what others are doing or take up special studies or courses. Beyond the period of medical school training leading to the degree of Doctor of Medicine come years of graduate study if one is to perfect oneself for general practice or to become a specialist.

These graduate years may come in the form of internships or residencies immediately following the course in medicine, or they may come later for a few months or years in sequence or on separate occasions.

More and more the hospital is becoming the center for advanced work in medicine and, consequently, the site for graduate work. The European hospital was for many years the center for graduate work for many American physicians. The marked changes in the last two decades have given our medical schools and hospitals world recognition and distinction, as well as a place of leadership full of responsibility for the future.

It is important for us to follow the steps that have been taken in order to see just where we are in graduate instruction and what the forces were that have brought us to our present level of achievement.

Thirty years ago, the main problem of graduate medical education in the United States was to correct deficiencies of graduates of low grade medical schools, to present up-to-date procedures, and thus make safer practitioners of medicine. In the graduate courses there were usually no standards of admission, no definite curriculum, no fixed periods of study, and the granting of certificates or diplomas was greatly abused. Many physicians proclaimed themselves as specialists after taking short and superficial courses.

THE 1913-1915 SURVEY

In 1913 a special committee of the Council on Medical Education was created, with Dr. Horace D. Arnold as chairman, to investigate the status of graduate teaching. During the next two years an inspection of the more important graduate schools was made and certain objectives of graduate medical education were formulated. These were (1) to offer advanced instruction and opportunities for research, (2) to prepare physicians for special fields of work, (3) to offer opportunities for review and for keeping in touch with the advances in medical science since the physicians graduated, and (4) to make up deficiencies in previous medical education.

It became evident that there could be no uniform admission requirements, since all licensed physicians should be given an opportunity to improve themselves. It was believed also that, in regulating certification of

* Read before the Thirty-Sixth Annual Congress on Medical Education and Licensure, Chicago, Feb. 12, 1940.

specialists, definite standards of graduate medical education might be set up. The ultimate aim of the 1913-1915 study of the Council was to furnish more competent physicians to the community. It was therefore thought desirable to encourage graduate medical study and its better organization.

The attitude of the Council toward the problem of instructing graduates in medicine has always been considered from the standpoint of the public good. In 1915 the most important problem facing the Council was that of raising standards among physicians in practice, in spite of the fact that the Council had no direct authority in the matter. A physician, once he has been granted the right to practice, retains that legal right, and he can be deprived of it by the state authorities only for grave misdemeanor.

Aside from opportunities for research, the better schools of medicine made little provision for graduates who sought advanced instruction. They were fully occupied with the details and difficulties of growing undergraduate programs. Before 1915 the schools showed little interest in the organization of "practitioners' courses." This field was left to the "post-graduate" schools. Some of the latter were of doubtful character, and as a class they were considered inferior and unsatisfactory. The Council felt that the better undergraduate schools should undertake to further graduate instruction as far as possible as a public service. The need for concentrated, practical, short term practitioner courses was emphasized. It was thought inadvisable to attempt to classify graduate schools.

THE 1919 STUDY

During 1919 Dr. Arthur D. Bevan, chairman of the Council, with Dr. Louis B. Wilson, chairman of the Council's special committee on graduate medical education, and various members of the committee visited all but a few of the graduate schools of the country. On the basis of this survey, the committee arrived at the following conclusions: (a) that the facilities for graduate medical work were entirely inadequate; (b) that legitimate demand for work of this kind should be met; (c) that this demand, which had heretofore been met by proprietary schools, should be met by the universities, and (d) that it would be desirable for from fifteen to twenty strong university medical schools to consider developing graduate departments.

At that time there were about 2,000 university and hospital positions, not including those in the number of graduate schools listed by the Council, which offered more or less opportunity for medical graduates to prepare themselves in special fields. With few exceptions these represented the only approach to graduate work in medicine on the university level.

Beginning in 1919 and thereafter until 1934, a list of graduate schools was published by the Council. Included in the first list were eighteen graduate medical schools, and seven of these were connected with universities. These were Alabama, California, Tulane, Harvard, Minnesota, Columbia and Pennsylvania. The University of Chicago had received a large endowment for establishing a school. On the 1934 list there were thirty-eight graduate schools, and thirty of these were medical schools or were affiliated with medical schools which offered an approved undergraduate course of instruction.

Opportunities for graduate study in Europe after the World War were limited largely to short courses of

lectures and clinical and laboratory demonstrations. Positions permitting individual study of patients were filled by each country's own medical graduates.

In 1919 there were two large groups of physicians seeking graduate study: those desiring continuation study for short periods and those desiring to fit themselves for special practice, the latter requiring a longer and more exacting preparation. It was estimated that 6,000 practicing physicians engaged in the short term study in 1919. Four thousand other graduate students were spending longer periods preparing themselves in special fields: a total of 10,000 medical graduates engaged in continuing their education.

THE 1922-1923 INSPECTION OF GRADUATE SCHOOLS

During 1922 and 1923 inspection of all graduate medical schools in the United States was made by the secretary of the Council and by Dr. Louis B. Wilson. Recommendations of the Council offered at that time were considered epoch making and largely shaped the future course of graduate study in medicine in this country. It was emphasized that the chief desire of the Council was to cooperate with graduate teaching institutions and hospitals in order to bring about a general adoption of certain principles of graduate medical education. These principles were endorsed by the House of Delegates of the American Medical Association in June 1923, and institutions seeking the Council's endorsement of their educational program readily complied.

In brief, these so-called principles provided safeguards against short cuts to special practice. The schools concerned cooperated with the Council by having their courses properly graded, by ascertaining the educational and professional qualifications of physicians applying for study, by including diagnostic and review courses, and by admitting to any course only those who were known to have the essential prerequisite preparation. Short-cut operative courses in surgical fields were condemned. Well organized, properly administered courses of study were believed to be the greatest need in medical education.

ELABORATION OF PRINCIPLES

At a preliminary conference on graduate medical instruction in the specialties, held in Chicago in November 1920, the chairman of the Council appointed Dr. Alfred C. Eycleshymer, University of Illinois, Dr. Guy S. Ford, University of Minnesota, and Dr. A. H. Lloyd, University of Michigan, as a special committee to report on certification of graduate work. At the annual conference on medical education held in Chicago, March 7-10, 1921, the special committee reported essentially as follows:

... The fulfilment of the conditions imposed by the colleges and universities, as far as medical schools are concerned, results in the student's taking about three years in the liberal arts course plus one year in medical subjects for the A.B. degree. ... At the end of the first or second year in the medical school ... the student is prepared to begin investigative work. He should be afforded an opportunity and encouraged to undertake such work whether he contemplates the practice or teaching of medicine. ... It is all important that we give immediate and serious consideration to the fact that graduate work in medical schools is rapidly decreasing. Without graduate students it is of little consequence to continue the discussion of graduate work and its certification.

At the last meeting of the Association of American Universities, its Committee on Academic and Professional Higher Degrees considered the reports of the Committees on Graduate Work from both the Association of American Medical Colleges and the Council on Medical Education and Hospitals, and con-

cluded that these reports were essentially in harmony with the principles adopted by the Association of American Universities.

In 1920 also, in order to secure a basis for the approval of graduate work, the Council appointed fifteen special committees of nine members each to recommend what preparation was deemed essential to secure expertness in each of the specialties to which they were assigned. The special fields of committee interest were:

- Internal Medicine, Dr. George Blumer, chairman.
- Pediatrics, Dr. Harry M. McClanahan, chairman.
- Neuropsychiatry, Dr. Arthur S. Hamilton, chairman.
- Dermatology and Syphilology, Dr. William Allen Pusey, chairman.
- Surgery, Dr. Charles H. Frazier, chairman.
- Ophthalmology, Dr. Walter B. Lancaster, chairman.
- Otolaryngology, Dr. Wendell C. Phillips, chairman.
- Orthopedic Surgery, Dr. Robert W. Lovett, chairman.
- Urology, Dr. Hugh H. Young, chairman.
- Obstetrics and Gynecology, Dr. John W. Williams, chairman.
- Public Health and Hygiene, Dr. Victor C. Vaughan, chairman.
- Anatomy, Dr. Clarence M. Jackson, chairman.
- Pharmacology and Therapeutics, Dr. Charles W. Edmunds, chairman.
- Physiology, Dr. Joseph Erlanger, chairman.
- Pathology and Bacteriology, Dr. James Ewing, chairman.

The reports of these committees were presented at the annual conference in 1921, and reprints of these reports were sent to the officers of all graduate medical schools.

It was the opinion of the then chairman of the Council, on the basis of these reports, that the stronger universities with medical schools should be requested to undertake the development of graduate courses. After such schools had been established, it was Dr. Bevan's opinion that practice in the specialties should be restricted to men who have had the proper training. In face of conditions existing at that time, it seemed clearly the duty of the medical profession to protect the public against ill trained and incompetent specialists by securing such action on the part of the universities and the state licensing boards.

Dr. Louis B. Wilson, chairman of the Council's Committee on Graduate Medical Education, in his summary of the reports on graduate training in the specialties indicated that it was impossible to do more than simply restate some of the suggestions made by the various committees on a university working basis. There was fair unanimity on requirements for premedical college training. At least one year's general internship was unanimously recommended except in the preclinical departments, where one year of laboratory work might be substituted.

The general tenor of the reports was that graduate work should be done in schools with associated hospitals. Four committees suggested apprenticeships to recognized specialists. Almost all of the committees specified adequate preclinical instruction for physicians entering the practice of a clinical specialty. There was great variation in the minimum time recommended for special training. This varied from one and one-half to three years. Few of the committees recommended didactic instruction. Laboratory experience and opportunity for self development were emphasized, as well as the importance of diagnosis and research.

The direct effect of this widespread study by representative physicians and other eminent scientists was the elaboration and adoption in 1923 by the House of

Delegates of the American Medical Association of the following principles:

Admission Requirements.—The minimum admission requirement for those wishing to prepare themselves for the practice of a specialty should be graduation from a recognized medical college and completion of at least one year's internship in an approved hospital, or the experience gained by at least five years spent in the active practice of medicine. In the case of reputable physicians who desire to improve themselves for general practice, lenient admission requirements are justified. Courses for *general practitioners* should be open to all physicians who have received the degree of Bachelor or Doctor of Medicine from medical colleges considered acceptable by this Council, or to reputable physicians who were licensed in certain states before graduation was required.

Records.—Records should be kept by each institution showing (a) the preliminary and professional entrance qualifications of every student, which should be verified by authentic or documentary evidence; (b) previous attendance at graduate courses and subjects taken; (c) the subjects for which he is enrolled; (d) evidence of faithful attendance at his work; (e) evidence of the student's proficiency as demonstrated by research work, examinations or otherwise, and (f) whether an advanced degree or certificate was granted.

Supervision.—There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out, fair ideals as determined by the present day needs of graduate medical education.

Curriculum and Grading of Instruction Offered.—The graduate school should have its various courses of instruction so graded that the student, if he desires, can obtain progressive work in a continuous course of two or three years, as may be necessary to prepare him satisfactorily for the practice of a chosen specialty. If it is found that at some previous time the student has satisfactorily completed certain portions of the work, he might be given advanced standing and thereby enabled to complete his preparation in a shorter time.

Where short operation courses are offered in any of the clinical specialties, they should be combined with review, diagnostic and clinical courses arranged either in one group for which a common fee is charged, or in a graded series so that, in effect, they would be segments of and, in total, the time and educational equivalent of the longer courses. These segments might be taken at different times but would ultimately lead the student to the same objective. With the exception of the courses in general medicine, all short courses should fit in with a scheme the ultimate aim of which would be a complete and satisfactory training in the specialty¹ for which the graduate school provides instruction. Any institution offering work in any specialty, therefore, should provide (a) review courses in anatomy, pathology and the other basic preclinical sciences which apply to the respective specialties; (b) clinics in which students can have the opportunity personally to examine patients in hospital wards and outpatient departments and in which various therapeutic and operative procedures can be demonstrated; (c) courses of operative and laboratory technic, and (d)—to be assigned only when the student's previous training will warrant—assistantships in which, under the supervision of a physician who is recognized as an expert in the particular specialty, he can gradually assume responsibility in the diagnosis and therapeutic or operative treatment of the sick. Opportunity should be provided also for research work in the chosen specialty

1. The several fields of clinical specialization which are referred to are shown in the following list. Following completion of an internship in a general hospital, the minimum years designated after each subject represent what were considered as essential to insure efficiency in the various specialties by the Committee on Graduate Medical Instruction in their reports which were presented at the Annual Conference on Medical Education held in Chicago, March 7, 1921:

Field	Years Essential	Field	Years Essential
(a) Surgery, General.....	3	(g) Internal Medicine.....	3
(b) Surgery, Orthopedic.....	3	(h) Pediatrics.....	3
(c) Surgery, Genito-Urinary.....	3	(i) Neuropsychiatry.....	3
(d) Gynecology and Obstetrics.....	3	(j) Dermatology.....	2
(e) Ophthalmology.....	2	(k) Public Health and Hygiene.....	2
(f) Otolaryngology.....	2		

bearing on both the fundamental sciences and clinical fields. With courses so graded, no student should be admitted to any advanced short course unless, on careful investigation, he is found to possess the knowledge and skill such as are obtainable in the other prerequisite courses.

Teachers.—The graduate medical school should be supplied with a corps of teachers well trained in and responsible for the work in all subjects in which opportunities for study are announced. This should include teachers for essential review or advanced work in the preclinical sciences, as well as those who have in charge work in clinical subjects. The teaching staff should be made up of graduates of or teachers in recognized medical colleges or other high grade educational institutions. The faculty should be organized under the various teaching departments in which work is offered, and a competent teacher should be at the head of each department.

Laboratories.—The school should possess a well equipped laboratory and clinical supplies essential for the specialty or specialties in which opportunities are offered. There should also be an adequate supply of special apparatus, such as stereopticons, balopticons, photomicrographic outfits and roentgen ray equipment.

Library and Museum Facilities.—The graduate school should have a medical library which should include an ample supply of modern text and reference books, files of bound medical periodicals, and the essential indexes. It should also receive regularly thirty or more standard medical periodicals, the latest numbers of which should be on tables or in racks where they are easily accessible to the graduate students. The school should be supplied also with adequate museum facilities, including anatomic and pathologic specimens.

Hospitals and Dispensaries.—The graduate medical school should have a teaching hospital with a daily average of 200 or more patients, and an outpatient clinic with an average of 100 or more patients each day; or, if teaching is limited to a single specialty, a hospital of not less than twenty-five patients daily and an outpatient clinic of at least fifty patients daily. In brief, it should have sufficient clinical material to enable it to provide satisfactory clinical study in the specialty or specialties for which opportunities are offered. In connection with the courses for general practitioners, ample clinical material should be available so that the student may be given the opportunity personally to examine patients in hospital wards and in the outpatient department, and to make the essential laboratory examinations.

Annual Announcements.—The graduate school should publish annually announcements, bulletins or catalogues giving detailed information in regard to its teachers, laboratories, dispensaries and hospitals; outlines of the various opportunities for study offered in both fundamental and clinical branches; a complete list of the students enrolled during the last preceding year, showing their medical schools and years of graduation, the subjects for which they registered and the time spent in each, and a list of those to whom advanced degrees or diploma-like certificates were granted.

Advanced Degrees, Diplomas, Certificates.—No advanced degree or diploma-like certificate should be granted to any one who is not known to be proficient in the specialty pursued; nor to any one, under any circumstances, who has not completed at least one academic year in full time study of a single special subject in the institution granting the certificate; and unless scholarship records of the student show that, throughout the period, he has faithfully attended to his work, and unless reasonable tests show that he has diligently and satisfactorily completed the work for which he was registered.

GRADUATE TRAINING AS SUPPORTED BY THE AMERICAN MEDICAL ASSOCIATION

In 1933 the chairman of the Council on Medical Education and Hospitals, reporting to this congress, indicated that the Council was ready to define its relationship with respect to the special practice of medicine and stated that it was possible to:

1. Provide certain minimum standards of education and training for specialists and to list in the American Medical Directory,

or in some special directory, those whose achievements equal these standards;

2. Provide lists of schools or institutions approved for the training of specialists;

3. List hospitals offering residencies or other positions suitable for the training of specialists;

4. Come to a decision as to the way in which those who are already in special fields shall be designated;

5. Work out, in conjunction with the Association of American Medical Colleges, the American Hospital Association, the National Board of Medical Examiners and the national societies, constructive plans for dealing with those who plan to enter special fields.

This proposal was freely discussed and on motion of Dr. Walter L. Biering, it was

Resolved, That it is the sense of this congress² that the Council on Medical Education and Hospitals of the American Medical Association be asked to carry forward its plan in developing control of the specialties.

At the 1933 annual session of the House of Delegates, Dr. Samuel J. Kopetzky introduced resolutions dealing with the listing of specialists in the American Medical Directory. The resolutions were referred to the Reference Committee on Medical Education. Dr. Irvin Abell, chairman of this reference committee, reported that Dr. Kopetzky's resolutions were fully and freely discussed by members of the Council and by representatives of the examining boards of the special societies, and that, as a result, the Reference Committee on Medical Education recommended the following resolutions (which were adopted):

WHEREAS, The Council on Medical Education and Hospitals for something more than a quarter of a century has been engaged in formulating standards for the training of physicians, and through its policy of investigation and publication has succeeded in elevating the general standard of medical education throughout the country; and

WHEREAS, In recent years the Council has, under the direction of the House of Delegates, in consultation with the leaders in these respective fields, established certain standards for the recognition of qualified physicians specializing in pathology and radiology; and

WHEREAS, There is evidence of a widespread interest in the problems of medical specialization and a very general demand that means be found and standards formulated by which specialists may be known and recognized by their fellows in the profession, and that in this process of standardization there should be a national and uniform standard rather than a multiplicity of standards represented by the various state boards and state societies; and

WHEREAS, A number of special examining boards, the American Board for Ophthalmic Examinations, the American Board of Otolaryngology, the American Board of Obstetrics and Gynecology, and the American Board of Dermatology and Syphilology, have been created to test the fitness and certify the qualifications of men engaged in, or desiring to engage in, special fields of practice, and such certificates have come to be regarded as establishing the skill and proficiency of those to whom they have been issued; and

WHEREAS, The Council may contribute to the usefulness of these special examining boards by granting some form of recognition to those which now, or hereafter, maintain satisfactory standards of organization and procedure; therefore be it

Resolved, That the Council on Medical Education and Hospitals is hereby authorized to express its approval of such special examining boards as conform to the standards of administration formulated by the Council; and be it further

2. Twenty-Ninth Annual Congress on Medical Education and Licensure, Feb. 13 and 14, 1933.

Resolved, That the Board of Trustees of the American Medical Association be urged to, use the machinery of the American Medical Association, including the publication of its Directory, in furthering the work of such examining boards as may be accredited by the Council.

In the annual report of the Council on Medical Education and Hospitals to the House of Delegates at the 1934 session, the essentials for an approved special examining board were submitted. The Reference Committee on Medical Education recommended that the essentials as presented be adopted "with the suggestion that definition of special fields be made more elastic, so that, for instance, one contemplating specialization in obstetrics would not be required to take the examination in gynecology also, and vice versa; further, that one desiring to specialize in gynecology and abdominal surgery could apply for examination in such fields without, as under the proposed setup, also being required to take the examination in general surgery and obstetrics. The field of internal medicine could be subdivided so as to cover those who restrict their activities to one of its integral parts."

In the 1936 annual report of the secretary of the Council to the members of the House of Delegates of the American Medical Association, the following recommendation was made:

Now that the survey of undergraduate medical schools is nearly complete, the Council has voted to undertake a survey of the graduate training of physicians. In this field there is naturally much more variety of aim and method than in undergraduate teaching. Roughly, graduate courses may be regarded as designed either for the training of specialists or for the improvement of practitioners. Under the former heading, opportunities may be further subdivided consisting of systematically arranged courses, including especially courses in those fundamental sciences which are prerequisite for satisfactory development in a specialty, and apprenticeships in which the student obtains actual clinical experience by assuming greater responsibilities in connection with the care of patients in a hospital, a dispensary or a physician's office. The second objective, namely, the improvement of practitioners, is achieved by means of instruction at many different levels ranging all the way from attendance at meetings of the county society or a hospital staff to a prolonged course of study in some graduate or postgraduate institution. This sort of instruction can also conveniently be classified under two main headings: first, those courses of instruction offered by recognized institutions in large centers of population with abundance of clinical material and, second, what may be called extension courses, in which the instruction is carried to the physician in or near his own home by selected teachers operating under the direction of the educational committee of the state society or some similar organization.

The Reference Committee on Medical Education, Dr. George Blumer, chairman, commended the plans for the study of graduate training of physicians in its various phases, the committee regarding graduate training as one of the most pressing problems facing the medical profession.

The report of the reference committee was adopted after a discussion by members of the House.

At the 1937 session of the House of Delegates it was reported that

The Council is now planning a study of graduate medical education in the United States. This will include the systematic courses offered in schools, hospital residencies and other types of apprenticeship, continuation courses for those in practice and the educational programs of medical societies. To carry out this program and at the same time discharge existing responsibilities will require an increase in the Council's staff, provision for which has already been made by the Board of Trustees.

The Reference Committee on Medical Education, Dr. F. S. Crockett, chairman, approved "the Council's proposed study of graduate medical education now in process of formation. The evident advantage of well organized and wisely planned methods of making available to the practicing physician the latest developments of medical science must be obvious to all."

The secretary of the Council in his 1938 report to the House of Delegates included the following statement:

During the past year the Council has commenced a study of graduate education, a field which is almost boundless and enormously complex. For convenience it has been subdivided into three major categories: extension courses, apprenticeships, and opportunities for graduate study. In the first category are found the educational programs of county and state societies together with many other similar activities. The second category consists chiefly of internships and residencies, the modern equivalent of the old-fashioned apprenticeships. Under the caption "Opportunities for Graduate Study" will be listed those offerings, for the most part under university auspices, which, though not necessarily leading to a degree, conform to the generally accepted standards of graduate work.

In 1939 the Council on Medical Education and Hospitals expressed the opinion to the members of the House of Delegates of the American Medical Association "that the attention of the constituent state societies of this Association should be called to the great importance of controlling the direction of programs of postgraduate education. Your reference committee herewith recommends that the House of Delegates empower the Council on Medical Education and Hospitals to carry out this purpose." This recommendation was adopted.

The Council on Medical Education and Hospitals requested, in its supplementary report to the House, that it be given permission to explore the possibility of cooperative relations with other organizations concerned in problems of graduate medical education. The reference committee, Dr. Harvey B. Stone, chairman, approved of this request, and on its recommendation the House of Delegates adopted the report.

CONTINUATION STUDY FOR PRACTICING PHYSICIANS

Since October 1937 all states have been visited by a representative of the Council for collection of data on the facilities available and programs in effect throughout the country. Progress reports on graduate activities of medical societies, medical schools, hospitals and other educational institutions have appeared in THE JOURNAL.

As a result of these studies, the following principles applicable to courses of continuation study for practicing physicians were elaborated:

1. That the courses of study should be organized and administered by a continuing, correlating committee within each state with representatives from the medical profession, the medical schools within the state and, when advisable, other interested medical and health organizations.
2. That there should be some support of graduate programs other than by registration fees alone, these being nominal, since recognized courses of continuation study are operated not for profit.
3. That clinical and scientific instruction should be designed to meet the current needs of physicians practicing throughout each state and should include discussions of all pertinent aspects of selected subjects, utilizing clinical material or case studies. Instruction should preferably be given by more than one instructor to provide an integrated course, and presumably should be of at least five days' duration.

4. That state medical societies should control the direction of extramural programs of continuation study.

5. That the names of physicians who engage in such study should be recorded by educational institutions and medical societies and may be published by them. Copies of such records should be furnished to the Council on Medical Education and Hospitals of the American Medical Association.

CONCLUSION

This historical summary of the activities of the American Medical Association and its Council on Medical Education and Hospitals would not be complete without reference to the close cooperation had with the Association of American Medical Colleges, the Federation of State Boards, the American Hospital Association and many institutions and societies. This has been a period of astounding growth in medical knowledge and great advances in undergraduate and graduate medical instruction. The reports of the special Commission on Medical Education in 1932 and the present studies being made of graduate medical education by a representative commission also indicate the vitality of American medicine, its capacity to grow, and the rapid responses made by a profession that demands constant study and steady progress.

THE GOAL OF MEDICAL EDUCATION

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From prehistoric times, medicine has aimed to provide the world with men qualified by training and experience to extend the boundaries of knowledge of man and his illnesses and to apply such knowledge to the alleviation of suffering. The temple of Aesculapius at Cos gave us Hippocrates and an orderly description of the manifestations of disease. Galen, by experimental methods, learned anatomy and physiology. His teachings were accepted for a thousand years. Vesalius and Harvey renewed the search for accurate information concerning the structure and function of the human body in order better to understand and cure disease. In modern times such eminent men as Virchow and Pasteur have greatly enlarged our knowledge of the causation of disease and thereby laid the foundation for rational treatment. To Ephraim McDowell, William Beaumont, Marion Sims, Crawford Long, William Thomas Green Morton, Weir Mitchell, John S. Billings, William Osler, W. W. Keen, W. H. Welch, Theobald Smith, Rudolph Matas, Harvey Cushing and a host of others, American medicine owes its unrivaled position, men who by study and investigation, teaching and practice placed ever greater knowledge and skill at the service of the practicing physician in his eternal warfare with death and disease.

Medical education in this country began as an apprenticeship which, whatever it may have lacked of broad scholarship, at least brought the novitiate into intimate daily contact with the sick, so that at the very beginning of his career his attention was focused on the needs and the behavior of the people rather than on abstractions labeled disease. Although for a time the clinical aspect of medical teaching suffered a partial eclipse, the most significant contribution of America in the field

of medical education has been the welding together of practical and theoretical instruction, of clinical and scientific medicine, into a comprehensive but unified program for the training of the modern disciple of Aesculapius and Hippocrates.

Emphasis on technical training, standardization of teaching and practice and study of economic factors in medicine is coordinated with the development of the intangibles that have done so much to make of medicine a growing science and an increasing art. Ideals, self sacrifice, personal and professional honesty, love of the search for knowledge, culture, judgment, common sense and imagination are qualities to be sought in addition to technical efficiency. The two major components of medicine, science and art, should retain a balanced relation to each other. The science of medicine is readily definable and as readily apprehended; the art of medicine is more elusive. The following quotation serves to elucidate it somewhat by comparison:

Art knows little of its birth, science knows its birth: registers it and its after history. Art is founded on experience; science is antecedent to experience. Art invents: science discovers. Art comes out of darkness, goes upon its own feet, can go anywhere across the country, and hunts more by scent than by sight: science goes upon wheels, but must have a road or a rail. Art furnishes a set of directions which vary with the artist and the task: science furnishes a body of connected facts which are the same for all people, circumstances and occasions. Art is often life-rented and dies with its possessor: science is transmissible. Art is completely personal, deals with actual problems of human conduct from economic, psychological and legal as well as from medical points of view: science is entirely impersonal, proceeds in an orderly manner toward the establishment of a cause and, if possible, to a remedy for disease. Art shows the how and cares less for the why: science says little as to the how but much as to the why. Art runs for the stomach pump while science studies the phenomena of the poisoning.

To the art of medicine all owe allegiance. Medical education to be complete must embrace instruction in the philosophy as well as the mechanics of medicine. It should arouse in the student the laudable desire to be associated, even in a small way, with the brilliant procession of physicians stretching back into dim antiquity who have enriched science and served humanity.

Medicine is the most ancient of professions, being older than Christianity and antedating the inception of civil law. It has its own system of rewards and punishments, its own disappointments and its own glories. It is a profession that has a broadening influence on the human mind and is characterized by a most splendid charity. It is an acquisition in the best tendencies and a protection against the worst tendencies. It constructs no trusts; it founds no monopolies; it excludes no qualified practitioner; it retains for its profit no valuable discovery and it has no standing room for the quack, the scoundrel and the charlatan. Its best work is done in the light which beats on its throne, not in the arena of politics encouraged by the cheers of thousands, not in the seclusion of the cloister sustained by the hope of eternal joy, but in the storm and wind swept country, in the streets of the village, in the boulevards of the city, on the desolate field of battle, where pain and pestilence, illness and misery are combated often with none but God to see it. It furnishes a curiously checkered life, a life in which storm clouds alternate with sunbeams.

With the exception of the ministry, it stands closer than any other calling to the secret of eternity and

watches death ever busy with her shuttle as she weaves her somber threads into the woof and warp of the affairs of men. It seeks to mitigate human suffering, to prolong human life. These have ever been its watch-words, are still and always will be, constituting its cloud of smoke by day and its pillar of fire by night. One should enter such a profession with properly exalted ideals, with a belief in its greatness, its dignity, its stability, its real importance, its essential strength. One should resolve to learn to observe, to compare, to analyze, to study, to think, to avoid formulas, to cast out sordid thoughts, to repudiate shallowness, advertising and vain pretensions. In short, to be a worthy disciple of Aesculapius, reflecting honor and credit on the profession and deriving from it the happiness that makes life worth while, being held in grateful remembrance by those whom one has served and in respect and esteem by the confrères with and among whom one has lived and worked.

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MEDICAL EDUCATION—1905 TO 1940

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At the turn of the century medical education in the United States was chaotic. Medical colleges associated with universities were endeavoring to establish a resemblance to similar institutions abroad. Proprietary medical schools were competing voraciously for medical students. Here and there about the landscape were fly-by-night institutions and diploma mills, existing for the single purpose of defrauding medical students, the medical profession and the public as well.

From 1880 to 1903 the number of medical colleges increased in the United States from ninety to 154.¹ The total number of students was more than doubled, moving from 11,826 to 27,615. During this period, when medical schools were increased by 133 per cent, the population of the country increased less than 50 per cent.

In these medical schools there was nothing resembling uniformity in the curriculum; the teaching of anatomy varied from 200 hours to 1,248, bacteriology from forty-five hours to 364 and pathology from fifty-four hours to 512. The time devoted to surgery varied from sixty-four hours to 1,168 hours, medicine from 140 hours to 1,232 hours and obstetrics from sixty-seven hours to 320 hours, depending on the personality and showmanship of the distinguished professors in these branches.

The preliminary requirements for medical education in 1880 were in some places as low as those which have prevailed for chiropractors; not even ability to read and write was involved.² By 1903 the medical schools required at least a nominal common school education. The situation in medical education was so confused, so threatening to the health of the people of the United States, so abysmally behind medical progress that many organizations began to interest themselves in raising standards to bring order out of chaos.

President Eliot, of Harvard University, prophesied in 1902 that "any university now in existence which does not require a college degree for admission to its professional schools will, in twenty years, find itself in an inferior position to those universities that do require it." A committee of the University of the State of New York said at that time that a uniform standard of admission to practice in the United States was impracticable. In 1903 the National Federation of Examining and Licensing Boards called attention to the confusion and stated that "minimum standard requirements for graduation in medicine should be established and maintained." Unfortunately, they made no suggestion as to how such requirements should be established or how they could be maintained.

Furthermore, in 1904 the Association of American Medical Colleges amended its by-laws, providing that after July 1, 1905, the sixty colleges holding membership in that body out of a total of some 160 then existing must either withdraw or demand as a minimum requirement for matriculation either diplomas showing completion of a four year high school or normal school course, a bachelor's degree from an approved college or university, or examination in certain specified branches. Even this loosely worded and equivocal requirement was made the subject of attack by the proprietors and promoters of many poor institutions, who complained that if they raised their standards they would lose their pupils.

Now much of this agitation was due to the fact that THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION had undertaken a survey of medical colleges of the United States in 1899 and had published data concerning them in its first Educational Number, printed in 1901. In these educational numbers all the available statistics regarding medical education were published, a procedure which has been followed consistently since that time. Also in 1901 a collection of the laws regulating the practice of medicine in the United States and its territories was published, and in 1903 an annual tabulation of the reports of state board examinations throughout the United States was initiated. In 1904 the Council on Medical Education and Hospitals was established and actual inspection by representatives of the Council was begun. Reports published in THE JOURNAL called attention to the prevailing lack of standards and the untrained personnel in many proprietary schools. The resentment to these criticisms was vicious. The Council therefore invited the Carnegie Foundation for the Advancement of Teaching to undertake an independent survey. Mr. Abraham Flexner was commissioned to make the study for the Carnegie Foundation and in 1908, accompanied by Dr. N. P. Colwell, Secretary of the Council, he began a new series of inspections. The results of these investigations, published in 1910, enhanced the influence of the Council in bringing about improvement in the standards of medical education. By 1914 a definite minimum standard of preliminary education necessary to obtain admission to medical schools was widely accepted. The requirement of two years of college after high school, including specified achievement in physics, chemistry and biology, became the minimum. It was established that there must be competent experienced teachers in the fundamental branches like anatomy and physiology. By 1914 it had become generally recognized that medicine must be learned primarily from observation of the sick and that the hospital and dispensary are just as necessary

Read before the Thirty-Sixth Annual Congress on Medical Education and Licensure, Chicago, Feb. 12, 1940.

1. Simmons, George H.: Some Fragments of History of the A. M. A.: III. Medical Education—Pioneer Work of The Journal, A. M. A. Bull. 28: 137 (Dec.) 1933.

2. Simmons, George H.: Medical Education and Preliminary Requirements, J. A. M. A. 42: 1205 (May 7) 1904.

to the medical school as the chemical laboratory or dissecting room. Finally it became apparent that medical schools must be integrated with education generally and that a medical school cannot be conducted primarily in the interest of or for the financial benefit of the faculty.

Now that a definite trend was established, medical education continued to improve, but, like every other human activity, it required a certain amount of persistent policing. There is no policing more efficient than that of public opinion. The regular publication, year after year, of the facts regarding institutions for medical education in the United States, the support given to the advancement of standards by some state licensing boards, and the regular publication of the ability of students from various medical schools to pass the examinations of the state licensing boards served to inform the public and to maintain the trend toward advancement.

From 1914 to 1929, medicine became the pet of the philanthropies. Now some medical schools were able to house themselves in magnificent buildings, to purchase extensive equipment, to establish foundations for research, to employ increasingly full time teachers in various branches and to advance steadily the amount of preliminary education required for students before entrance. Next came the World War, and the entering class of 1918 was the smallest on record. Since that time there has been a steady advance in the number of students admitted to medical schools. Indeed, the number of applicants has increased so steadily that approximately twice as many now apply as can be accepted.

Unfortunately, 1929 witnessed the onset of a financial depression. Since that time gifts have decreased, endowments have yielded less and less income, costs of supplies have risen, and medical school financiers have racked their brains to discover funds with which to function. Is it surprising therefore to find in this period of economic scarcity an increasing reluctance to maintain high standards and an increasing resentment against forces that observe and criticize and publish widely both observations and criticisms?

THE COMMISSION ON MEDICAL EDUCATION

In 1925 the Commission on Medical Education, created by the Association of American Medical Colleges, began a survey of medical education and licensure in this country and abroad. Soon it became interested in the relation of medical education to medical practice and the distribution of medical service. This commission recognized the wide differences in buildings, equipment, personnel, students, financial support, hospital facilities and educational policies of the medical schools; but the final report, made available in 1932, came at a time when an economic depression caused relaxation of standards in medical education as well as in many other aspects of human endeavor. This report, however, emphasized the necessity for retaining and extending certain fundamental advantages in the American scheme of medical practice. Moreover, it suggested that the solution of our problem is not the destruction of the present system of education and practice but the evolution of a pattern which will embrace the desirable features of present methods and correct their defects.

While the report of this commission indicated a belief that there is an oversupply of physicians in our country

and the likelihood that this oversupply would increase not only from the output of approved medical schools in the United States and Canada but also from the graduates of foreign schools, sociologists, economists and welfare agencies were urging an increase in the number of physicians with a view to wider distribution of low cost medical care.

Significantly the statement was made by the commission that an opportunity had come for medical schools and universities to assume a more important influence in shaping public and legislative opinion regarding the qualifications and training of those who should be permitted to treat the sick. It was urged that the responsibility for training physicians should now be left to the universities, which should be given freedom to develop this phase of professional education. It was urged further that representatives of the Association of American Medical Colleges, the Federation of State Medical Boards, the American Medical Association and the universities ought to cooperate in developing a comprehensive program of medical education and licensure. This suggestion, made in 1932, has been persistently promoted by its proponents, leading to the formation in 1939 of the so-called Advisory Council on Medical Education.

During the period from 1925 to 1932 the Council on Medical Education and Hospitals had somewhat relaxed in its activities. Perhaps like Achilles it may have been sulking in its tent. Perhaps its members felt that the commission should be given every opportunity to function without extraneous influences or interference. But after the report of the commission was published the Council on Medical Education and Hospitals in September 1933 undertook a new survey of medical teaching. It requested the assistance and cooperation of the Association of American Medical Colleges and of the Federation of State Medical Boards. That survey has recently been completed. Representatives of the Council visited eighty-nine schools in the United States and Canada, in company with a representative of the college association or of the medical boards. The results of this study, recently published, as well as a careful analysis of a vast amount of data supplied voluntarily by the schools, indicate that there is still a great difference in quality between the best schools and the worst. However, even the weakest of the medical schools today is a stable institution as compared with the proprietary schools and diploma mills which existed before the Council on Medical Education and Hospitals began to function. The Council on Medical Education and Hospitals determined therefore to refrain from publishing an individual analysis and criticism of each of the medical schools in the United States. Comparisons would have been odious and such an action might have destroyed public confidence in many a school capable of prompt improvement or even in medical education as a whole. Instead the Council sent to each of the schools the results of its investigation. This analysis has already stimulated many weaker schools to attempt to bring themselves up to a higher standard. It has shown even to some leading schools specific deficiencies in certain departments. Already universities are evincing greater interest in their medical departments; attempts are being made to develop new hospital relationships; faculties of medical schools are taking more intense and personal interest in the improvement of the institutions with which they are associated.

BODIES INTERESTED IN MEDICAL EDUCATION

At the turn of the century, chief interest in the field of medical education reposed in the faculties of the medical schools themselves. A few universities had a casual interest. The state medical boards were beginning to evolve into bodies of far greater general intelligence, ethical conduct and legal authority than they possessed previously. The hospitals were but little interested in the medical schools, and far more for what they could get out of the school than for what they could contribute to medical education. Today the entire scheme has been vastly elaborated. The number of groups or bodies interested in medical education is tremendously increased. The universities and colleges individually and through their organizations have a real interest in premedical education. Those universities which possess medical departments have a special interest in the conduct of medical education. The hospitals have increased from something under 1,000 to more than 7,000 in number, and almost 750 of these hospitals have now been put on the approved list by the Council on Medical Education and Hospitals as institutions which have met the minimum requirements to make them suitable for the training of interns. Beyond the internships are the fellowships and established residencies for the young men who wish to qualify themselves in the specialties and to be better able to meet the requirements of the certifying boards in the various specialties.

Moreover, such organizations as the Colleges of Surgeons and of Physicians and of Radiologists, which demand special qualifications of the young men who wish to participate in their deliberations, have much to say about certain aspects of medical education. The state medical boards have been enhanced by a considerable number of basic science boards and by the National Board of Medical Examiners. The increasing interest of states and of the federal government in medical practice has stimulated governmental and political officials to investigate the conduct of medical education. As the boards for the certification of specialists have come into the field, associated bodies have developed in the form of an advisory board to the certifying boards, a new advisory body in the whole field of medical education and hospitals, known as the Advisory Council on Medical Education, and finally an advisory committee to the Council on Medical Education and Hospitals. Finally, there is even an association of interns wishing also to regulate the internship. The exact significance of these multiple groups of advisers and coordinators and examiners and regulators is not yet apparent. The very recent origin of many of them would seem to indicate that they have yet to prove the reasons for their existence. Many of these bodies are self-constituted agencies which represent extremely limited interests; some endeavor to function on budgets more limited than their interests or with no budget at all; few have outlets for their cogitations and their resolutions beyond the little groups of serious thinkers from which the resolutions emanate.

In the more than thirty-five years during which the Council on Medical Education and Hospitals has functioned for the advancement of medical education, its cost to the physicians of the country has approximated somewhere between two and three million dollars. This Council is a body established by the House of Delegates of the American Medical Association, a representative

body speaking for 116,000 practicing physicians who supply medical service to the American people. The Council is elected by the House of Delegates and reports directly to the House of Delegates. Its annual budget and the costs of its activities are certainly sufficient to indicate that any other agency coming into this field should likewise conduct active investigations before drawing conclusions. Obviously this demands a considerable trained personnel, the confidence of the medical profession and of the public in its altruistic character, and opportunity for widespread dissemination to both the profession and the public of its observations and its conclusions.

THE INTERNSHIP

Recently it has been asserted that control by the medical school over the young physician should persist beyond the date of his graduation through his internship.³ Yet if the school is to control the young man through the internship, why should it hesitate to maintain its control through the residency or the fellowship? Why indeed should the schools not insist also on controlling licensure? We have already prolonged the infancy of the young man in medicine so that he represents the longest period of dependence of any human being who will ultimately function as a producing unit in the community.

In the development of the internship the most important unit is the hospital. Medical college administrators and deans may feel that they are somewhat harassed by legislative interference, investigation by the American Medical Association, suggestions and resolutions by the Association of American Medical Colleges and indictment by public opinion. Compared with the hospitals, they live in a state of glorious independence of action and freedom. The hospitals are subject to investigations by all these agencies and also by the Hospital Division of the American College of Surgeons, the American, Catholic and Protestant Hospital Associations, local, county, state and federal officials, inspectors for certifying boards for the specialties, and innumerable social service and welfare organizations.

And now it is proposed that the medical colleges establish and exercise a supervisory control over all hospitals in which their graduates may become interns. This proposal would complicate the situation beyond any reason or necessity. The suggestion has been made by some of the leaders in the Association of American Medical Colleges that the integration of the medical school and the hospital phase of instruction can be carried out if the medical schools in each of the national geographic sections of the country group themselves into regional committees to evaluate the internships in their own areas. The hospitals in each area that are found satisfactory would be listed in the central office of the Association of American Medical Colleges, and the state boards of medical examiners would be requested to require an internship approved under such education and supervision before admitting a graduate in medicine to licensure. Moreover, hospitals would not be permitted to have interns unless the staff was considered by the committee from the educational institutions to be competent and unless there should be appointed a director of educational activities suitable to the colleges or a committee of the staff to coordinate

3. Rappleye, Willard C.: *The Challenge to Medical Education*. *J. Am. M. Colleges* 15:1 (Jan.) 1940.

the instructional program. It is proposed indeed to demand that any hospital which cares to have interns will have to affiliate itself with a medical school. That would mean quite certainly that many city, county and state institutions would have to yield their direction and control to the medical schools rather than to continue under their legally constituted officers. Otherwise they could obtain no interns. What strange unrest in these troublous times could cause any group of intelligent leaders in medical education to consider even for a moment such a vastly involved, highly theoretical and fantastic scheme? Will any considerable number of the 750 hospitals of this country, now approved for internship by the Council on Medical Education and Hospitals, submit to such preposterous dictation? Have not those who proposed this scheme utterly forgotten that the chief function of a hospital is not the teaching of interns but the care of sick patients? If, in the care of the sick, a hospital can lend itself suitably to the education of interns and of nurses and to the research functions in which many hospitals engage, there is no reason why it should not thus fulfil these obligations of a good hospital. But the care of the sick must not be delegated to a subservient place because of dominance by newly created agencies whose prime interest is medical education.

MEDICAL EDUCATION THEN AND NOW

Number of Medical Schools.—In 1908 there were 156 medical schools in the United States, many of which were of exceedingly low grade. Today there are sixty-six medical schools which offer a full four year course leading to the degree of doctor of medicine; ten offer only the first two years, and one school offers only the last two years of the medical course. From the least qualified of these schools to the best qualified there is a wide area of divergence, but even the weakest of the present day schools is far superior to the average of 1908. Furthermore, the recent survey conducted by the Council on Medical Education and Hospitals has served to call attention to the specific weaknesses which exist in each of these institutions, and already many of them are making astounding advances toward improvement. What more could any other body have accomplished at less cost to our medical institutions or with more benefit to medical education and the public?

Preliminary Training of a Doctor.—In 1908, 119 schools required a high school education or less, twenty-six schools required one year of college, and eleven schools required two years of college. Today eleven schools require two years of college, but sixty-one require three years of college and five schools require a bachelor's degree or its equivalent before entrance into the medical curriculum. The trend has been toward men of greater and greater preparedness; it is a trend in which medical educators have been leaders but in which the Council has been the inspiration.

The Budgets of Medical Schools.—In 1908, income was derived almost exclusively from student fees. Many schools were proprietary and planned to yield profit to the faculties, who were also the owners. Today the income from private endowments or state appropriations constitutes over 60 per cent of the total income of medical schools. It is no longer possible to provide satisfactory medical education on student fees alone. The financial difficulties of some of the medical schools

have caused them to seek appropriations from federal governmental agencies. Have they counted the costs in loss of initiative and in freedom of conduct?

The Faculties.—In 1908 the faculties of most medical schools consisted almost wholly of practicing doctors who had not been especially trained in the teaching of anatomy, physiology, pathology or bacteriology. Today in practically every medical school the faculty in the fundamental branches is composed of trained men who devote themselves wholly to teaching and research. In the clinical branches the impetus toward complete full time faculties has lagged. Obviously full time leadership in administration and research may be desirable. But contact of advanced medical students with physicians who are daily in the individual practice of medicine is an inspirational advantage that cannot be tossed aside.

Laboratory Facilities.—In 1908 the teaching in medical schools was largely by lecture, with an occasional demonstration by the professor for all the students. Today almost every medical school in the United States approved by the Council on Medical Education and Hospitals has laboratories fully equipped for teaching and research, in which every student has access to personal opportunity for dissection, the use of the microscope and first hand studies in physiology and pathology.

Clinical Facilities.—In 1908 there were few medical schools directly associated with hospitals designed for teaching. Students learned their medicine on occasional private patients and from lectures and demonstrations in the clinic. Nowadays many large schools have teaching hospitals, and in all the schools two or more years is devoted to clinical teaching. During these two years practical instruction is given to small groups of students at the bedside or in the dispensary. The clinical clerkship, moreover, gives the student practical training preliminary to the internship. But the usefulness of the closed staff hospital for teaching and research should not make us blind to the educational advantages of the hundreds of hospitals whose chief function is the care of the sick.

CURRENT PROBLEMS IN MEDICAL EDUCATION

Somewhat startling is the aspect of the Association of American Medical Colleges concerning itself so largely in a recent session with the problems of the internship, when obviously the field of undergraduate medical education needs a vast amount of careful consideration. The rapid progress of medical science demands constant study of the curriculum to determine how to include such significant topics as allergy, medical economics, medical ethics, chemotherapy, physical therapy and physiologic surgery.

The trend of medical practice makes it exceedingly difficult to determine the stresses that are to be placed relatively on training for general practice or on training for participation in a group, a closed hospital staff or a private specialty practice. How simple would be the standardization of the curriculum were some dictatorial power to determine that all physicians of the future would be included in fixed groups, with rigidly limited specialties, and with income wholly on a salary basis. Fortunately for the people of the United States, the trend does not seem to be in this direction. The great majority of our medical schools will continue to

train young men to become general physicians; at least 65 per cent of graduates will continue to elect that type of service. With proper integration of the general practitioner into the staff of the hospital, that type of medical practice is likely to appeal more and more to the competent young men who now graduate from our medical colleges. It is hard to see how good medical service can be provided for the vast majority of Americans in any other way. Beyond the undergraduate medical school will come the special graduate training, leading toward participation in a specialty practice. Fortunately, until now there has been no attempt to dissociate leadership by the medical profession from training in the more technical aspects of medical practice. Indeed, it is possible to view with alarm any and all attempts to encourage extramedical leadership in medical education.

CONCLUSION

The extraordinary record of progress which has just been cited should be sufficient to indicate to any one that American medical education is not in the slough of despondency or in the doldrums of lassitude. It is not, as has been alleged for one third of the nation, undernourished, badly housed and insufficiently clothed. Our medical colleges today represent as fine a group of institutions for the teaching of medicine as can be found in any great nation of the world. They compare more than favorably with the educational institutions for medicine in England, France, Germany, Austria and even that model for modern America, the government of Sweden.

The Council on Medical Education and Hospitals, which has served for the past thirty-five years to stimulate continued progress and to guide development, is still functioning with the same earnestness, altruism and high ideals that animated it in the past. It has within recent months integrated its work with that of the hospital associations, the colleges of the various specialties and the certifying boards. Why then should there be at this time incitements to detract from its functions and to destroy its influence? Why should agencies without sufficient visible financial support, without official recognition from any well organized democratic medical body, without any excuse for existence except as arises within their own ambitions, seek to invade this field with a view to bringing about something in the nature of a new deal? The only visible reason would seem to be that groups outside the medical profession which have striven to stir up public dissatisfaction with medical service have been able to animate and utilize some of the interests in the field of medical education.

Fortunately, it has already been discovered in Washington that there is a limit which must be placed both on the rate and on the amount of change that can be accomplished in a given period, and even President Franklin Delano Roosevelt himself has recently indicated a desire to proceed gradually and to gain experience by cautious experimentation.

Out of economic depression and social unrest come dissatisfaction and resentment. It has been said that there is no deficiency in the provision of medical care in the United States that will not be cured by restoration of the economy of the nation to stability. It can be said with equal surety that once the tumult and the shouting occasioned by the Committee on the Costs of Medical Care, the American Foundation Studies in

Government and the abortive National Health Conference and the National Health Program have died, then too will educators in the field of medicine, leaders in the administration of hospitals, and the physicians of this country realize that leadership in medical education and provision of medical service to all the people must come from the medical profession itself, through the institutions which the profession has established for that purpose.

535 North Dearborn Street.

A HOSPITAL EPIDEMIC OF FLEXNER DYSENTERY CAUSED BY CON- TAMINATED ICE

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AND

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NEW HAVEN, CONN.

Epidemics of dysentery seemingly have always been with us. Davison,¹ in his study of bacillary dysentery, traced the history of the disease from the earliest recorded times. While dysentery has commonly been called an asylum disease, it is surprising that hospital outbreaks have been relatively rare, and particularly is this true of the Flexner type. In late years the Flexner epidemic reported by Felsen and others² from Jersey City is probably the best known. We have made a rather complete survey of the recent literature and have been unable to find more than three additional Flexner outbreaks in institutions. Block and Simon³ reported an epidemic due to either raw milk or food contaminated by carriers in a mental hospital, while Litteral and Steele^{3a} reported two outbreaks in the same hospital in the Canal Zone.

There have been reported at least two other outbreaks of bacillary dysentery among hospital staff members, although neither was caused by the Flexner strain organism. Cann and deNavasquez⁴ described an explosive outbreak of Sonne dysentery among nurses. The investigators felt that the original source of infection was a food handler carrier. More recently, Sigoloff and Baron⁵ discussed a series of cases among hospital employees, where again it was believed that the origin was an intermittent carrier who happened to be a food handler.

The history of ice-borne enteric disease is also meager. Nichols⁶ reported an outbreak of intestinal disorder which he attributed to drinking water con-

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Prof. C.-E. A. Winslow gave advice and criticism during preparation of the manuscript; Dr. Millard Knowlton and Mr. F. O. A. Almquist were cooperative during the study and made many helpful suggestions. Dr. J. S. Cunningham assisted in the epidemiologic investigation and did much of the interviewing.

1. Davison, W. C.: *Medicine* 1: 389 (Nov.) 1922.

2. Felsen, Joseph; Rundlett, Emilie V.; Sullivan, James, and Gorenburg, Harold: *Atypical Flexner Dysentery: Preliminary Report of Jersey City Epidemic*, J. A. M. A. 103: 1055 (Oct. 6) 1934.

3. Block, L. H., and Simon, Abraham: *Am. J. Digest. Dis. & Nutrition* 3: 305 (July) 1936.

3a. Litteral, E. B., and Steele, R. D.: *Am. J. Pub. Health* 27: 819 (Aug.) 1937.

4. Cann, L. W., and DeNavasquez, S.: *J. Hyg.* 31: 361 (July) 1931.

5. Sigoloff, Emanuel, and Baron, M. E.: *J. Missouri M. A.* 32: 194 (May) 1935.

6. Nichols, A. H., in *Seventh Annual Report of the State Board of Health of Massachusetts, 1876*, p. 476.

taminated by impure ice, and Chamberlain⁷ discussed impure ice and its connection with enteric fever. Sedgwick and Winslow⁸ have reported at length on the survival of the typhoid bacillus in ice, and they summarized the literature to that date. Whipple⁹ and Cumming¹⁰ pointed out the danger of contamination of ice through handling. Cumming stated at that time, "It is therefore impossible to overestimate the danger resulting from the handling of ice by unknown persons if the ice is placed in direct contact with drinking water." Chapin¹¹ believed that there was little epidemiologic evidence of any sickness being caused by polluted or contaminated ice. Conway¹² wrote of an outbreak of typhoid fever due to ice which was harvested from a known polluted source.

So far as we could determine, there have been no reported outbreaks of bacillary dysentery attributed to ice. However, Shadday¹³ outlined an outbreak on ship-board where polluted ice was known to have been used up to three days before the epidemic. He concluded that the outbreak was food borne.

DYSENTERY PRECEDING THE OUTBREAK

Sept. 2, 1937, J. T. was admitted to a hospital in Connecticut with the diagnosis of gastro-enteritis. September 16, V. C. was admitted to the same ward with

Incidence of Dysentery-like Disease Among Hospital Employees, from Sept. 24 Through Oct. 30, 1937

Occupation	Number Employed	Number Sick	Per Cent Sick
House physicians	10	9	90
Graduate nurses	67	11	17
Student nurses	83	27	33
Orderlies	7	1	14
Porters	17	2	12
Waitresses	11	5	45
Housekeepers, laundresses, maid, storekeepers	50	3	6
Office employees and others	38	1	2
Visiting physicians	?	1	..
	283	60	21

the diagnosis of colitis and otitis media. September 29, V. T. and Jo. T. were admitted with the diagnosis of ileocolitis and placed in the same ward. H. L., admitted September 12 with a diagnosis of fractured femur and advanced rickets, also was in this ward. All of these were children, three of them brothers and sisters.

Routine stools taken from these children after repeated watery discharge with some mucus and blood revealed that *Shigella paradysenteriae* Flexner was present at some time or other during the early part of October in the case of V. C., H. L. and Jo. T. Stools of the others were negative for this organism, but the clinical courses were strongly suggestive of dysentery-like infections.

It is essential to note that all these patients were children, most of whom were from the same family, and all but one of them were admitted for a definite gastro-

intestinal upset. In the cases of H. L. and V. C. it is quite possible that cross infection occurred from some of the clinical dysentery within the hospital.

THE EPIDEMIC ITSELF

During the month of October a considerable number of cases of intestinal disease occurred among members of the hospital staff, and a number of stools submitted to the state laboratory at Hartford proved positive for Flexner dysentery. On October 30 the reports on these cases and rumors which reached the local health officer from physicians indicated the need for an investigation.

At the outset of the investigation, attention was diverted by persistent rumors, later proved to be unfounded, that there was a generalized outbreak of dysentery in the city. The authorities at the hospital seemed to be of the opinion that the cause of the outbreak was outside the hospital, rather than inside, and suggested that the city water supply was at fault.

General Inquiry.—To check rumors of a widespread epidemic we interviewed some 350 boys and girls in one of the high schools, which draws its enrolment from all sections of the city. Under severe and searching questioning, there was practically no indication from this group that any one had suffered the symptoms generally present in epidemic bacillary dysentery. The records of all children for the entire month of October, when this reputed outbreak occurred, were studied for absences. Every one who had been absent for any reason whatever was closely questioned as to the cause of his missing school. Among this group there was no indication that any one, including their families, had had dysentery. It is interesting to note that we uncovered two or three other acute medical problems among the group interviewed.

Not satisfied with this searching inquiry, questionnaires were sent out to 400 grammar school teachers in this city. They were asked to record any and all symptoms which they may have had and which might be associated with gastro-enteritis, as we had been told that this ailment existed in the city at large. Again negative replies poured into the office of the health department.

Simultaneously with this part of our work, questionnaires had been mailed to most of the local general practitioners. They were asked to list the names, addresses and condition of all patients seen during the months of September and October for whom a diagnosis of dysentery had been made. Results from this questionnaire were again largely negative.

Inquiry was also made at the other hospital, at the town home and at the dispensaries of three of the larger manufacturing concerns. Results from these sources were also negative.

The Hospital Inquiry.—While these negative results were being accumulated, the investigation at the hospital was simultaneously undertaken. The entire personnel of 283 employees was interviewed. From this questioning it was brought out that there were a number of cases among the various employees in the hospital, and continued inquiry finally uncovered sixty persons in all who were clinically sick or who had suffered from illness including some of the symptoms of bacillary dysentery. A total of 353 stool specimens were examined at state and local health department laboratories from the sixty persons mentioned. Of this group, nineteen had positive stools. Chart 1 indicates the number in each occupational group of hospital

7. Chamberlain, C. W., in Fifth Annual Report of the State Board of Health of Connecticut, 1882, p. 297.

8. Sedgwick, W. T., and Winslow, C.-E. A.: Mem. Am. Acad. Arts & Sc. 12: 472, 1902.

9. Whipple, G. C.: Typhoid Fever. New York, John Wiley & Sons, 1908.

10. Cumming, H. S.: Pub. Health Rep. 29: 2066, 1914.

11. Chapin, C. V.: The Sources and Modes of Infection, New York, John Wiley & Sons, 1910.

12. Conway, J. A.: Am. J. Pub. Health 14: 574 (July) 1924.

13. Shadday, A. A.: U. S. Nav. M. Bull. 34: 16 (Jan.) 1936.

employees who had dysentery-like symptoms during the epidemic.

The incidence of dysentery-like disease in the various groups of hospital employees is indicated in the table for the period from September 24 through October 30, after which date no additional cases occurred. One fifth of all the hospital staff were affected, including 90 per cent of the house physicians.

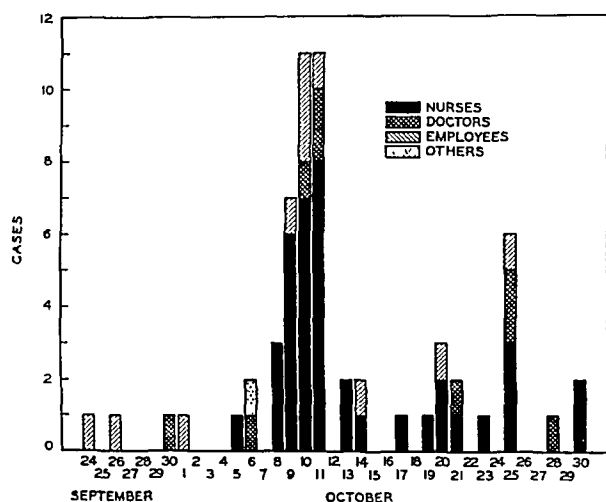


Chart 1.—Dysentery cases in the hospital, September-October 1937.

Meanwhile, two nurses of the health department reviewed all the clinical reports and hospital records of patients hospitalized during the months of September and October. The results of this survey showed that there were no dysentery-like symptoms among the patients during this period, with the exception of the five original cases already mentioned. During the course of the medical inquiry a very severe interrogation of employees, such as the floor nurse, general nurses, maids, interns and orderlies, who were connected with ward 4-north, where the original patients had been hospitalized, was undertaken in an effort to determine whether there was any connection between them and the outbreak among the personnel of the hospital. The results of this interrogation were negative; but because of the interval which had elapsed we felt that the trail had become cold and, although unable to establish the fact, we feel it very probable that the cases among the personnel had some primary connection with the original cases in this ward.

It seemed clear, in any case, that the October outbreak was due to some common cause operating on the hospital staff and not on the patients; and food transmission was an obvious possibility. While the investigation was being conducted, therefore, all infected food handlers were required to discontinue handling food until such time as they had two negative urine and feces examinations; all other food handlers, whether infected or not, were required to have two negative stools. It is interesting to note that our routine laboratory examination of food handlers revealed a typhoid carrier, several confirmatory stool examinations all showing evidence of the typhoid bacillus. The man gave a history of having had typhoid thirty years previously.

Relation to Food Supply.—Chart 2 shows the general course of food distribution within the hospital. It will

be noted that from the standpoint of dining room service the hospital population may be divided into four groups, served respectively by the private kitchens, the ward kitchen, the employees' dining room and the nurses' and doctors' pantry. Not a single case (except the first five) occurred among the large group of patients served by the private kitchens and the ward kitchen. Of the actual total of sixty patients, fifty-four were served from the nurses' and doctors' pantry while four (including two porters and two storekeepers) normally used the employees' dining room but were definitely known to have had access at special times to the nurses' and doctors' pantry. This is also a possibility with the other two patients (a maid and an orderly). Thus it was clear that infection must have occurred between the main kitchen and this pantry.

On the other hand, the time curve of the epidemic (chart 1) showed that we were dealing with something more than a single infection in point of time. During the two weeks following the initial case on September 24 six other persons gave a dysentery-like history. On October 8 three cases occurred, on the 9th there were seven, and apparently the peak of the epidemic was reached on October 10 and 11, when eleven cases appeared on each day. After this initial peak there was a period of quiescence with a total of twelve cases occurring as follows: two on the 13th, 14th and 21st, one each on the 17th, 19th and 23d, and three on the 20th of the month. This chain of cases culminated in a secondary peak of six cases on October 25, and the epidemic subsided after three more cases, one on the 28th and two on the 30th.

Our attention was therefore next turned to the search for insanitary conditions which might have caused contamination of food and drink in one special group of the hospital population.

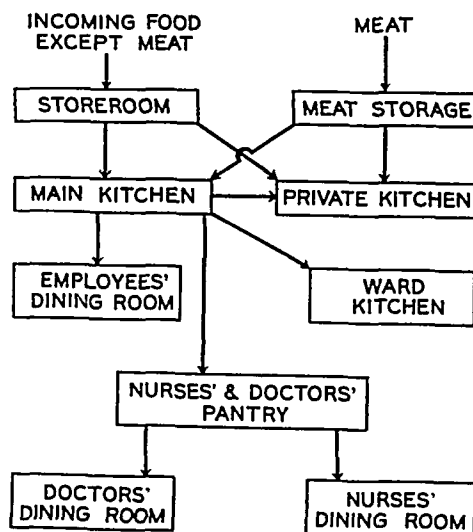


Chart 2.—Course of food distribution in the hospital, October 1937.

Engineering Studies.—On November 3 we became convinced that the outbreak had been confined to this hospital, and most of the subsequent work was concentrated there. Samples of water taken at the hospital and from taps on the high service system in the vicinity of the hospital on November 4 and 5 were all negative for coli-aerogenes group organisms. These reports came from the laboratory of the Connecticut State Department of Health.

On the afternoon of November 3 one of us (M. A. P.), accompanied by the city plumbing inspector and the hospital plumber, made a thorough inspection of the house plumbing, and this was repeated with F. O. A. Almquist, senior sanitary engineer, Connecticut State Department of Health, November 4. The results of these inspections indicated that (1) there were no direct cross connections between used fixtures and the water supply lines within the hospital, (2) there were within the hospital at least eighty-two possibilities of interconnections between the sewerage system and the water supply lines, and (3) the handling of ice was carried on in an insanitary manner.

The large number of possible interconnections between the used fixtures (chiefly bath tubs and bed pan washers) all involved relatively remote possibilities of infection, involving as a rule possibilities of back-siphonage in case of reduced water pressure occurring simultaneously with plugged drain lines. Such possibilities should not be permitted in hospital plumbing; but they appear to have played no part in the present epidemic. There was no evidence that lowered pressure had actually occurred. It appeared that while the possibility of back-siphonage existed in many cases, the probability of occurrence of the precise chain of circumstances needed for pollution of the water supply was extremely slight. Furthermore, it was apparent that if a cross connection due to any circumstances had occurred between the sewerage system and water supply on the fourth floor of one wing (the children's ward) where all the original patients with dysentery, hospitalized from the outside and suspected as sources of infection from the first, were isolated, cases would have been rather evenly distributed through that wing on the lower floors. Such was not the case. Furthermore, it would be impossible for a cross connection so far removed from the main pantry to contaminate the water in such a way as to produce infection only in the water coming from one tap some 250 feet away, four floors below and on the other side of the house system from the inlet main.

On the other hand, the slovenly handling of ice at once attracted our attention. Mr. Almquist on November 4 had taken two samples of ice water from a butter tub used for distributing ice to the water pitchers used on the tables of the nurses' and physicians' dining room. Both of these samples showed heavy contamination with *coli-aerogenes organisms*.

Ice Handling.—During most of the year ice is manufactured in sufficient quantities at the hospital to take care of all the needs. Only in the summer is ice bought from outside sources. The ice machine is in the basement and is of an antiquated type, with old wooden covers over the freezing cans. The cans are pulled by hand, and the ice is taken out of the cans on a platform nearby. On this concrete platform ice is chopped up and taken in a butter tub upstairs for use in the pantries. Ice water is made in pitchers, ice being taken by hand from the butter tub, washed inadequately and then dumped into the pitcher. The butter tub was reputed to be washed daily with hot water. We never saw this done, and the butter tub itself showed small evidence of such frequent baths. One man generally carries the ice up to the pantry from the basement; he takes off by hand enough to provide ice water for the menial help in their dining room; then the tub is placed

in control of a young woman whose duty it is to make ice water in the serving pantry of the nurses' and doctors' dining room.

City water is used for making the ice. It is drawn from upland sources of good quality and twice chlorinated and shows excellent bacteriologic quality. There is small chance for contamination before freezing, and during the process of freezing the cans are surrounded by brine, wooden covers being used to keep out stray dirt. Unfortunately, these covers are in bad shape, and people frequently walk around on top of the ice machine. Nearby there is an overflow sink from an ice box upstairs. This sink sometimes clogs up, and the waste water flows over on to the ice machine. However, there is slight chance that this is a source of contamination because, before reaching the ice, the waste water would have to pass through a strong brine solution.

The two weak links in this chain are (1) the dumping of ice on the concrete platform and (2) the handling in the kitchen by two different persons who use their hands as scoops. Should either of them be slack in their personal habits, disastrous results would almost certainly follow if either happened to be a carrier of intestinal disease at the time.

Now it happens that the young woman whose duty it was to prepare ice water for the nurses' and doctors' pantry was Y. C., the first patient among the hospital employees, who appears in chart 1 under the date September 24. This young woman on September 24 complained of severe griping, some nausea and a few loose stools, although she was not prostrated and continued to work as a helper in the serving pantry connected with the dining rooms in which the professional staff take their meals. During the course of our routine stool examinations on food handlers, Y. C., whose specimens were cultured sixteen times, never showed evidence of infection with *Shigella paradysenteriae* Flexner. It must be remembered, however, that these stool specimens were taken at least seven weeks after her apparent attack and it seems exceedingly probable that she was the active cause of the outbreak among the hospital employees.

SUMMARY AND CONCLUSIONS

It was conclusively proved that the epidemic was confined to the hospital rather than to the city at large. Furthermore, the disease was limited to those groups of employees using the nurses' and doctors' pantry. This association was proved in fifty-eight of sixty cases and could probably be assumed in the other two. The epidemic was thus clearly associated with food or drink served from this particular pantry.

Thorough inspection indicated many possible sanitary hazards in the hospital but only one which was serious, that associated with the handling of the ice. Artificial ice, made from city water of good quality, was chopped up under insanitary conditions and distributed by a wagon to the various special pantries. That used in the nurses' and doctors' pantry was stored in an ice tub which was apparently seldom cleaned, and the water in this tub showed heavy contamination with fecal organisms.

The young woman who handled this ice in the nurses' and doctors' pantry was the initial patient in the outbreak of dysentery among hospital employees.

135 West Main Street.

Clinical Notes, Suggestions and New Instruments

ABDOMINAL APOPLEXY

SPONTANEOUS RUPTURE OF A VISCERAL VESSEL

GEORGE CRILE JR., M.D., AND EDWARD T. NEWELL JR., M.D., CLEVELAND

Spontaneous rupture of a visceral vessel into the peritoneum or between the leaves of the mesentery has occasionally been reported in the literature, but it has usually been associated with trauma, intra-abdominal disease or malignant growth. Spontaneous rupture of a visceral vessel due to arteriosclerosis and hypertension is an extremely rare occurrence as judged by the reports in the literature, although most of the authors express their surprise that this phenomenon does not occur more frequently. The case presented here apparently belongs to the latter group of rare cases of abdominal apoplexy caused by marked arteriosclerosis and hypertension. We use the word "apparently" because in this case the exact site of rupture was not located.

In reviewing the literature we found that ten previous cases of abdominal apoplexy associated with arteriosclerosis and hypertension have been reported: (1) Hilliard's¹ case in 1918, (2) Starcke's² case in 1923, (3) Green and Powers's³ case in 1931, (4) Buchbinder and Greene's⁴ case in 1935, (5) Mourgue-Molines and Cabanac's⁵ case in 1933, (6) Thompson and Dunphy's⁶ case in 1935, (7 and 8) Moorehead and McLester's⁷ two cases in 1936, (9) Morton's⁸ case in 1938 and (10) Silverstone's⁹ case in 1938. In 1937 Bruce¹⁰ reported the occurrence of an abdominal hemorrhage from an aneurysm of the middle colic artery of a man aged 75 but he was of the opinion that the aneurysm was of congenital origin rather than associated with arteriosclerosis. He did not mention the presence of hypertension. It is of interest that exploratory operation was done in eight of the ten cases. In four cases the bleeding point was found and ligated with recovery. In two others the bleeding had apparently subsided at the time of operation, and recovery occurred also in these cases. In two the bleeding point was not found and death occurred shortly after operation. In the two cases in which no operation was performed, the diagnosis was established by postmortem examination after rather sudden deaths associated with abdominal symptoms.

REPORT OF CASE

History.—A man aged 49 was admitted to the Cleveland Clinic Hospital April 3, 1939, with a diagnosis of essential hypertension and advanced arteriosclerosis. The patient had had symptoms referable to his hypertension for four years, during which time his blood pressure averaged 260 mm. of mercury systolic and 130 mm. diastolic. Celiac ganglionectomy was performed on the left and on the right respectively on April 5 and May 1 by Dr. Crile Sr. Convalescence was uneventful after the first operation and for four days after the second operation.

In the afternoon of the fourth day after the second ganglionectomy the patient suddenly experienced severe abdominal pain accompanied by marked pallor, sweating and a rapid, weak pulse. Examination of the abdomen revealed tenderness in the left side of the epigastrium and an epigastric mass about the

size of a grapefruit which could not be well outlined. There was moderate muscle spasm but no rigidity. The patient was observed for three hours, during which time his condition grew steadily more critical, despite the use of all the usual methods of combating shock. The pallor became more marked and the blood pressure and pulse could not be obtained. A diagnosis of a progressing intra-abdominal hemorrhage was made and the patient was prepared for operation. A transfusion of 500 cc. of blood was given and dextrose solution was administered intravenously.

Operation.—The left and then the right celiac lumbar wound was explored, but no evidence of hemorrhage could be found. An exploratory laparotomy was then performed, and when the peritoneal cavity was entered about 500 cc. of bloody fluid was encountered. A large hematoma was found lying between the leaves of the transverse mesocolon, the hematoma involving the transverse colon for an area of 6 inches (15 cm.). The mesocolon was incised, many large clots were evacuated, and an attempt was made to locate the source of the hemorrhage. The bleeding point could not be immediately located and, owing to the critical condition of the patient, the involved portions of the transverse colon and mesocolon were rapidly resected over a Rankin clamp, the base of the mesentery was packed with gauze drains, and the two ends of the transverse colon were brought to the surface after a Mikulicz type of obstructive resection.

During the course of the operation the patient received a second blood transfusion of 500 cc. and additional intravenous fluids. The operation was performed with the patient under local anesthesia, oxygen being administered throughout the procedure. The pulse, which was imperceptible at the onset of the operation, was faintly palpable at the close.

Postoperative History.—The postoperative course was prolonged, but after four weeks the patient's condition was satisfactory for closure of the colostomy. He was discharged from the hospital six weeks after the abdominal hemorrhage.

Pathologic examination of the resected portion of the transverse mesocolon and colon did not reveal the ruptured vessel, although the arteries all showed considerable arteriosclerosis. It seems possible that the rupture occurred in one of the branches of the middle colic artery and that this was controlled either by ligation of the mesentery, as it was resected, or by the gauze packs which were inserted. The location of the hematoma between the leaves of the transverse mesocolon rather than near the celiac axis precludes the possibility of trauma from the previous operations as a causative factor.

A letter from the patient's family revealed that the patient returned home and was in fair health for one month. However, after the extraction of a tooth, the patient suddenly had a cerebral hemorrhage and died.

SUMMARY

A patient with severe essential hypertension and advanced arteriosclerosis had spontaneous abdominal apoplexy.

The hemorrhage was controlled by resection of the transverse colon and mesocolon and the patient recovered.

Euclid Avenue at Ninety-Third Street.

Surgery.—The perfect job in life is one which offers steady employment while the faculties remain active, reasonable remuneration, a succession of tasks sufficiently varied to demand constant care and provide constant interest, freedom from dictation or interference, and a knowledge that the work is necessary and beneficial. Most branches of medicine satisfy some of these demands, but few, other than surgery, satisfy all. The surgeon is sometimes despised by his fellows of brains and bottles as a mechanical craftsman. But though he be a heaver of wood and a drawer of water, he has the assurance that such services are useful to mankind. His work is concerned almost entirely with the restoration of the healthy to health, and not at all with the preservation of the unwanted to an existence that is not human life, and the degradation of that biological heritage that has been built up for us by aeons of evolution. Surgery may not require brains or bring a fortune, but it is the best job in the world.—Ogilvie, W. H., in *Doctors in Shirt Sleeves*, edited by Sir Henry Bashford, London, Kegan Paul, Trench, Trubner & Co., Ltd., 1939.

From the Cleveland Clinic.

1. Hilliard, J. W.: Spontaneous Hemorrhage into Peritoneal Cavity, *Brit. M. J.* **1**: 231 (Feb. 23) 1918.

2. Starcke, G.: Spontaneous Rupture of Gastroduodenal Artery, *Ugesk. f. læger* **85**: 963-964 (Dec. 27) 1923.

3. Green, W. T., and Powers, J. H.: Intra-Abdominal Apoplexy, *Ann. Surg.* **93**: 1070-1074 (May) 1931.

4. Buchbinder, J. R., and Greene, E. I.: Intra-Abdominal Apoplexy, *J. A. M. A.* **105**: 874 (Sept. 14) 1935.

5. Mourgue-Molines, E., and Cabanac: Abondante hémorragie intrapéritonéale par infarctus de l'épiploon-gastro-hépatique, *Bull. et mém. Soc. nat. de chir.* **59**: 720-727 (May 13) 1933.

6. Thompson, K. W., and Dunphy, J. E.: Intra-Abdominal Apoplexy, *Ann. Surg.* **102**: 1116-1118 (Dec.) 1935.

7. Moorehead, M. T., and McLester, J. S.: Abdominal Apoplexy: Fatal Intra-peritoneal Hemorrhage Due to Spontaneous Rupture of Visceral Artery, *J. A. M. A.* **106**: 373-374 (Feb. 1) 1936.

8. Morton, C. B.: Intra-Abdominal Apoplexy, *Arch. Surg.* **136**: 723-728 (May) 1938.

9. Silverstone, Maurice: Massive Spontaneous Intra-peritoneal Hemorrhage, *Brit. M. J.* **1**: 230-231 (Jan. 29) 1938.

10. Bruce, John: Massive Spontaneous Intra-peritoneal Hemorrhage (Spontaneous Hemoperitoneum), *Lancet* **1**: 1451-1454 (June 19) 1937.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SULFAPYRIDINE (See Revised Supplement to New and Nonofficial Remedies, 1939, p. 29; also THE JOURNAL, Jan. 27, 1940, p. 327).

The following dosage form has been accepted:

Tablets Sulfapyridine-Parke, Davis & Company, 0.5 Gm. (7.7 grains).

Prepared by Parke, Davis & Co., Detroit. No U. S. patent or trademark.

SULFAPYRIDINE (See Revised Supplement to New and Nonofficial Remedies, 1939, p. 28).

The following products have been accepted:

Sulfapyridine-Squibb.—A brand of sulfapyridine-N. N. R. Manufactured by E. R. Squibb & Sons, New York. No U. S. patent or trademark.

Capsules Sulfapyridine-Squibb, 0.25 Gm. (3.38 grains).

Tablets Sulfapyridine-Squibb, 0.5 Gm. (7.7 grains).

Sulfapyridine Sodium Monohydrate-Merck.—A brand of sulfapyridine sodium-N. N. R.

Manufactured by Merck & Co., Inc., Rahway, N. J. U. S. patent applied for on sulfapyridine manufactured by Merck & Co., Inc., by license of May & Baker, Ltd., Dagenham, England. No U. S. trademark.

SULFAPYRIDINE SODIUM.—The monohydrate sodium salt of 2-sulfanilamidopyridine (Sulfapyridine, Revised Supplement to New and Nonofficial Remedies, 1939, p. 29; also THE JOURNAL, Jan. 27, 1940, p. 327).

Actions and Uses.—The monohydrate sodium salt of sulfapyridine has essentially the same therapeutic activities and properties as does sulfapyridine. Hence at the present time its use can be recommended only in pneumococcic infections, and its clinical use in gonococcic, streptococcic, staphylococcic, Welch bacillary and other types of infections must be considered in the experimental stage.

Solutions of sulfapyridine sodium in distilled water are strongly alkaline and have a *pH* ranging from 10 to 11. When a 5 per cent solution of this drug is injected intravenously, the sodium ion is probably promptly split off, leaving sulfapyridine. Thus, in the final analysis, the sodium salt of sulfapyridine represents a vehicle for introducing the slightly soluble sulfapyridine intravenously. The drug, being highly alkaline, is definitely irritating to the tissues and hence should never be given except intravenously. If it is given by the subcutaneous, intramuscular, intrathecal or any other parenteral route, necrosis and sloughing of the tissue may take place.

The indications for the use of sulfapyridine sodium are those cases of severe pneumococcic infections in which it is desired to obtain promptly adequate blood concentrations of sulfapyridine or in patients who, by reason of vomiting, are not obtaining proper concentrations of the drug when sulfapyridine is given orally, and finally, patients in whom either the absorption of the drug is poor or its rate of conjugation is such that adequate concentrations of sulfapyridine cannot be obtained in the blood by other means. With the exception of severe pneumococcic infections such as pneumococcic meningitis, it is rarely necessary to use intravenous injections of solution of sulfapyridine sodium more than once or twice. Frequent and repeated injections of the drug are not advisable because such injections tend to produce thrombosis of the veins.

Dosage.—The intravenous injection of 0.01 Gm. per kilogram of body weight of the sodium salt of sulfapyridine will produce, within an hour, a concentration of approximately 1 mg. of sulfapyridine per hundred cubic centimeters of blood. The usual dose of the drug for patients severely ill with pneumonia is based on 0.06 Gm. per kilogram of body weight. The drug is weighed out and is then dissolved in sufficient sterile distilled water to make a 5 per cent solution. This solution will have a *pH* of about 10.8. It should not be sterilized by boiling or autoclaving because the sodium salt is unstable under such conditions. The sodium salt of sulfapyridine should not be dissolved in sterile

physiologic solution of sodium chloride, dextrose solution or other types of solutions which are used parenterally. Solution of this drug should be administered only intravenously and at the rate of 5 cc. per minute. Solutions of sulfapyridine sodium should always be given separately and in different containers from other parenteral fluids. In other words, solutions of the drug should not be poured into containers which have been used for other parenteral solutions. It should never be poured into a transfusion bottle either preceding, during or just after a blood transfusion. If more than one dose of the sulfapyridine sodium is considered necessary, it is best to administer such doses at intervals of about six hours. When the sodium salt of sulfapyridine is being used, frequent determinations of the concentration of sulfapyridine in the blood should be made by the method described by Bratton and Marshall (J. Biol. Chem. 128:537 [May] 1939).

Sulfapyridine sodium is a white, odorless, practically tasteless, crystalline powder. It is soluble to the extent of 75 Gm. in 100 cc. of water at 25°C.; soluble in alcohol; very sparingly soluble in acetone. The aqueous solution is alkaline to phenolphthalein; its *pH* is approximately 11.5. Precipitate an aqueous solution of sulfapyridine sodium with diluted acetic acid, filter and wash with ice-cold water; dry at 100°C.; the precipitate melts between 191 and 192°C. The substance imparts a yellow color to the nonluminous flame. The amount of free chloride and/or sulfate ions does not exceed 0.01 per cent chloride ion or 0.02 per cent sulfate ion (U. S. P. XI, pp. 487, 488). The test for heavy metals (U. S. P. XI, p. 488) is negative. Boil 0.5 Gm. in 5 cc. of water with 5 cc. four-normal sodium hydroxide solution; no odor of ammonia is noticeable.

Transfer to a weighing bottle about 0.1 Gm. of sulfapyridine sodium accurately weighed, and dry in the oven at 105°C. for ten hours; the loss in weight is not less than 6.2 per cent nor more than 6.5 per cent.

Transfer the equivalent of about 5 to 25 mg. of sulfapyridine sodium accurately weighed, to a micro Kjeldahl digestion flask of about 50 cc. capacity, add 2 to 10 cc. of concentrated sulfuric acid, 10 to 50 mg. of selenium, 50 to 100 mg. of potassium sulfate, and 10 to 50 mg. of copper sulfate, depending on the amount taken, and place on an electrically heated digestion rack with a glass hood attached. Heat the mixture gently until frothing ceases; then boil the solution and continue the digestion until the mixture is colorless or nearly so, or until oxidation is complete (approximately fifteen to sixty minutes). Cool, add about 4 to 20 cc. of water, and transfer to a micro Kjeldahl distilling apparatus (J. A. O. A. C. 16:255, 1933). Add 5 to 25 cc. of 10 per cent sodium hydroxide solution and distill with steam into 10 to 50 cc. of 0.05 normal hydrochloric acid. Titrate with 0.05 normal sodium hydroxide, using methyl red as indicator. Each cubic centimeter of 0.05 normal hydrochloric acid consumed corresponds to 0.70 mg. of nitrogen. The nitrogen content should not be less than 15.2 per cent nor more than 15.7 per cent. The sulfapyridine content of sulfapyridine sodium is determined as outlined under sulfapyridine. Marshall's (J. Biol. Chem. 128:544 [May] 1939) trichloroacetic acid method is also applicable. The solid substance exhibits an intense bluish white fluorescence under the ultraviolet light.

ASCORBIC ACID (See New and Nonofficial Remedies, 1939, p. 499).

Stearns Ascorbic Acid Tablets, 25 mg.

Prepared by Frederick Stearns & Company, Detroit, Mich.

OLD TUBERCULIN (See New and Nonofficial Remedies, 1939, p. 420).

The National Drug Co., Philadelphia.

Tuberculin Intracutaneous for Mantoux Test.—Also marketed in packages of one ampule (single test) containing 1 cc. of a 1 to 100 dilution of old tuberculin (O. T.) with vial of glycerin bouillon control sufficient for ten single tests; and in packages of one ampule (single test) containing 5 cc. of a 1 to 100 dilution of old tuberculin (O. T.) with vial of glycerin bouillon for control sufficient for fifty single tests.

BISMUTH SUBSALICYLATE (See New and Nonofficial Remedies, 1939, p. 141).

Hyposols Bismuth Subsalicylate in Oil, 60 cc. size, Drug Products Co. This multiple dose vial contains in each cubic centimeter bismuth subsalicylate 130 mg., chlorobutanol anhydrous 30 mg. and arachis oil q. s.

Prepared by the Drug Products Company, Inc., Long Island City, N. Y.

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1939, p. 226).

The following dosage forms have been accepted:

Capsules Ephedrine Sulfate-Smith, Dorsey, 0.048 Gm. (¾ grain).

Capsules Ephedrine Sulfate-Smith, Dorsey, 0.025 Gm. (⅓ grain).

Prepared by The Smith-Dorsey Co., Lincoln, Neb. No U. S. patent or trademark.

SODIUM MORRHUATE (See New and Nonofficial Remedies, 1939, p. 461).

The following dosage form has been accepted:

Ampul-Vials Sodium Morrhuate with Quinine. Each cubic centimeter contains sodium morrhuate 0.05 Gm., quinine alkaloid-U. S. P. 0.02 Gm., and benzyl alcohol 0.02 Gm. in aqueous solution. U. S. patent 2,037,197 (April 14, 1936; expires 1953), and 2,046,116 (June 30, 1936; expires 1955).

Prepared by The National Drug Company, Philadelphia, Pa.

BARBITAL-ABBOTT (See New and Nonofficial Remedies, 1939, p. 115).

The following dosage form has been accepted:

Barbitel-Abbott Tablets, 5 grains.

HOSPITAL SERVICE IN THE UNITED STATES

NINETEENTH ANNUAL PRESENTATION OF HOSPITAL DATA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

One person every 3.2 seconds is the rate at which patients entered hospitals during the year 1939.

The total number of patients admitted by all registered hospitals in the United States was 9,879,244. This does not include the 1,099,713 babies that were born in hospitals during the year. The general hospitals alone reported 1,051,286 births and the maternity hospitals 45,664.

The increase of admissions over the previous year is 458,169. The nonprofit hospitals, including churches, fraternities and other nonprofit associations, contributed 338,144 to this increase.

The average census of patients was 996,483.

The total number of registered hospitals is 6,226, an increase of sixty during the year.

The total number of beds now available in registered hospitals is 1,195,026, an increase of 33,646 beds, which

in capacity to receive registration as evidence of qualifications to serve the sick and injured. Other factors tending to augment the number and patronage of hospitals are public consciousness of hospital service, extension of facilities to hitherto unserved areas, use of tax funds for hospital expansion, and use of rural hospitals as a necessary adjunct to medical service for communities.

The total patient days of hospital service for the year 1939 was 363,716,295, an increase over 1938 of 11,233,605. The number of patient days is obtained by multiplying the average daily census by 365.

The capacity of registered hospitals has practically doubled since 1918 and trebled since 1909.

The hospitals that are approved for internships, residencies and fellowships have greater capacity than all of the hospitals that were in existence in 1909. The

SUMMARY OF HOSPITAL DATA

	Number	Beds	Bassinets	Patients Admitted in 1939
1. Registered hospitals and sanatoriums approved for internships, residencies and fellowships.....	1,022	434,777	26,470	5,300,499
2. Other registered hospitals, sanatoriums and related institutions	5,204	760,249	32,294	4,578,745
Total registered.....	6,226	1,195,026	58,764	9,879,244
Of the foregoing, the American College of Surgeons approves.....	2,354	549,695	36,805	7,066,593
3. Refused registration after investigation (capacity 17,049).....				Number 548
4. Unclassified emergency stations, clinics, offices, cottages, and so on, with facilities for bed care (capacity unknown)				2,247
5. Prospective hospitals and sanatoriums:				
a. Opened. Registration pending.....				119
b. Under construction.....				68
c. Planned. Construction pending.....				158

is the equivalent of a ninety-two bed hospital for each day in the year, Sundays and holidays included.

There are 1,376 state accredited schools of nursing as against 1,395 a year ago. Accredited schools reported 85,642 student nurses in 1939.

The average number of beds idle throughout the year was 198,543, as compared with 195,674 for the year 1938.

General hospitals were occupied to 69.2 per cent of capacity as compared with 68.9 per cent the preceding year. The average number of idle beds in general hospitals in 1939 was 136,956. In 1938 it was 132,454. The types or groups of hospitals in which there was growth, and those which showed decline, are revealed in the summaries and tables included in this article.

The main cause for increase in number of registered hospitals is the response of hitherto unregistered hospitals to hospital insurance plans which affiliate only with registered hospitals. This has stimulated improvement in services, equipment and personnel, and increase

number of patients admitted to these hospitals in 1939 exceeds the number admitted to all other registered hospitals, sanatoriums and related institutions.

During the year 1939 the Council on Medical Education and Hospitals at its three business meetings admitted to the Register 183 hospitals having an aggregate capacity of 9,164 beds and 828 bassinets. Those hospitals were located in forty-three states and their average size was fifty-one beds. Included were fourteen that had previously been refused registration and subsequently changed hands or improved in compliance with requirements for registration. During the year 1938 the Council admitted 258 hospitals to the Register.

RESPONSE TO ANNUAL CENSUS

In response to the annual census form which was mailed to all the hospitals that appear in the Register, reports were received from all but fifty-one institutions, a record of 99.18 per cent. The response on the basis of bed capacity was 99.59 per cent. Those that did not

report included three epileptic colonies, aggregating 2,861 beds, and other institutions of a related character which may not regard themselves as being hospitals. However, the existence of these hospitals and their capacity are known, and they are, therefore, mentioned in the Register.

Summary of Growth of Hospitals, 1909 to 1939

Year	Federal Hospitals		State Hospitals		All Other Hospitals		Total	
	Num-ber	Capa-city	Num-ber	Capa-city	Num-ber	Capa-city	Num-ber	Capa-city
1909	71	8,827	232	189,049	4,056	223,189	4,359	421,065
1914	93	12,602	294	232,834	4,630	287,045	5,037	532,481
1918	110	18,815	303	262,254	4,910	331,182	5,323	612,251
1923	220	33,869	601	302,208	6,009	399,645	6,830	735,722
1928	294	61,765	595	369,739	5,963	461,410	6,852	892,934
1931	291	69,170	576	419,282	5,746	485,663	6,613	974,115
1932	301	74,151	568	442,691	5,693	497,602	6,562	1,014,354
1933	235	75,635	557	459,646	5,585	491,765	6,437	1,027,046
1934	313	77,865	544	473,035	5,477	497,201	6,334	1,048,101
1935	316	83,353	526	483,994	5,404	507,792	6,246	1,075,139
1936	323	84,234	524	503,306	5,342	509,181	6,189	1,096,721
1937	329	97,931	522	508,913	5,277	517,684	6,128	1,124,548
1938	330	92,248	523	541,270	5,313	527,853	6,166	1,161,380
1939	320	96,338	523	560,575	5,374	538,113	6,226	1,195,026

The annual census form is purposely brief; only essential information is requested, all of which is used. The results are published for the benefit of everybody concerned. Fiscal matters and other data that may be of a confidential nature are not requested.

Benefits of registration obviously are made possible by the splendid cooperation of the hospitals themselves. The publication of the names of registered hospitals in THE JOURNAL, the American Medical Directory and

Percentage of Beds Occupied

	1929	1933	1938	1939
According to Ownership or Control:				
Federal.....	76.8	75.0	81.8	83.8
State.....	94.6	94.5	94.7	94.2
County.....	80.7	85.8	83.1	85.5
City.....	74.3	83.0	81.1	80.0
City-county.....	80.2	75.5	72.5	74.9
Total governmental.....	88.9	90.1	90.4	90.4
Church.....	66.7	54.9	67.4	67.0
Fraternal.....	68.7	64.5	76.1	72.0
Nonprofit corporations and associations.....	.....	.....	69.0	69.0
Industrial.....	54.4	44.4	.....	.....
Independent associations.....	65.9	58.5	.....	.....
Total nonprofit.....	.....	.....	68.1	68.6
Individual and partnership.....	54.2	41.1	50.5	50.0
Corporations (profit unrestricted).....	.....	.....	58.9	61.0
Total proprietary.....	.....	.....	54.4	55.2
Total nongovernmental.....	61.6	55.3	63.1	66.4
According to Type of Service:				
General.....	65.5	59.9	68.9	69.2
Nervous and mental.....	95.7	95.1	95.0	95.2
Tuberculosis.....	82.7	85.3	87.1	86.2
Maternity.....	62.8	60.8	62.0	64.0
Industrial.....	54.6	44.2	49.5	50.5
Eye, ear, nose and throat.....	47.7	45.6	54.2	53.9
Children's.....	65.9	65.9	69.5	68.4
Orthopedic.....	50.2	76.9	78.9	74.6
Isolation.....	36.1	41.2	40.9	37.4
Convalescent and rest.....	70.9	69.2	73.6	78.8
Hospital departments of institutions.....	63.0	60.1	67.5	72.8
All other hospitals.....	74.6	79.5	64.7	83.0
Total all hospitals.....	80.1	78.8	83.2	83.4

other publications is publicity of the highest order. This recognition is all the more valuable because it is granted by an authoritative body without cost to the hospital. It is the basis of acceptance of hospitals by hospital service plans, insurance companies and numerous governmental agencies and medical and hospital organizations. The aggregate volume of publication of the list of hospitals by the American Medical Association since 1909 amounts to more than 130,000,000 pages.

GAINS AND LOSSES BY GROUPS

Figures on government hospitals show continued growth in number, capacity and occupancy. There are 1,740 hospitals with 845,146 beds and 9,604 bassinets operated by federal, state and local governments. Their average census is 764,048, an increase of 27,361 in 1939, as compared with an increase of 17,807 in 1938. Patients admitted to government hospitals were 2,734,375, a gain of 127,095 over the previous year. The average number of idle beds in hospitals run by governments—federal, state and local—was 81,098 in 1939 and 78,449 in 1938. The gains by the governmental group are due mainly to expansion of county hospitals and city hospitals. These and other changes are readily grasped with a glance at the footings of table 1 A, which presents figures by years.

Unoccupied Beds in Hospitals

	1929	1938	1939
According to Ownership or Control:			
Federal.....	13,868	16,778	15,646
State.....	21,064	28,410	23,575
County.....	12,625	16,339	14,739
City.....	14,688	14,174	15,485
City-county.....	2,807	2,668	2,515
Total governmental.....	65,052	78,419	81,959
Church.....	37,785	38,945	38,756
Fraternal.....	1,656	187	1,129
Nonprofit corporations and associations.....	.....	51,435	53,284
Industrial.....	3,107	.....	.....
Independent associations.....	54,794	.....	.....
Total nonprofit.....	.....	91,367	92,179
Individuals and partnerships.....	17,373	14,938	14,921
Corporations (profit unrestricted).....	.....	10,920	10,512
Total proprietary.....	.....	25,858	25,433
Total nongovernmental.....	114,715	117,225	117,415
According to Type of Service:			
General.....	123,025	132,454	136,956
Nervous and mental.....	18,079	29,485	29,181
Tuberculosis.....	10,603	9,780	10,485
Maternity.....	2,022	2,270	2,001
Industrial.....	3,180	1,510	1,500
Eye, ear, nose and throat.....	1,383	812	1,128
Children's.....	1,857	1,649	1,627
Orthopedic.....	1,175	1,505	1,954
Isolation.....	4,745	3,634	4,416
Convalescent and rest.....	1,886	1,541	1,873
Hospital departments of institutions.....	9,148	7,078	6,514
All other hospitals.....	2,364	3,856	476
Total unoccupied beds—all hospitals....	180,267	185,674	188,741

County hospitals now number 501, having gained eleven. They have 100,976 beds, a gain of 4,355; 2,748 bassinets, a gain of 167; 589,280 admissions, a gain of 37,214, and 86,177 average census, a gain of 5,915. Though less pronounced, considerable expansion it will be noticed took place in city hospitals. City-county hospitals, which declined one in number, showed no conspicuous change in statistics. In the federal column there is a loss of one hospital but growth in the capacity and the occupancy figures. State hospitals remain stationary at 523 but made conspicuous gains in the number of beds, patients admitted and the average census. Gains in this group are supported largely by increased building of state mental hospitals, and there is evidence that there is still gross, and even shameful, overcrowding in many institutions.

NONGOVERNMENTAL HOSPITALS

The majority of acute medical and surgical patients are hospitalized in institutions operated by nonprofit organizations including churches, fraternities and nonprofit corporations and associations. These group-

aggregate 2,840 hospitals, an increase of eighty-three during the year; 293,505 beds, an increase of 4,004; 41,415 bassinets, an increase of 1,572; 6,186,250 patients admitted, an increase of 338,144, and 201,326 average census, an increase of 3,192. Their admissions constitute 62.6 per cent of the total number

How Hospitals Shared in Patients Admitted

	Number of Patients Admitted		Share (per cent) of All Patients Admitted	
	1931	1939	1931	1939
According to Ownership or Control:				
Federal.....	301,149	477,417	4.2	4.8
State.....	388,084	588,907	5.4	6.0
County.....	345,236	559,280	4.8	6.0
City.....	689,239	931,295	9.6	9.6
City-county.....	108,450	127,856	1.5	1.3
Total governmental.....	1,833,078	2,734,375	25.6	27.7
Church.....	2,013,352	2,682,762	28.1	27.1
Fraternal.....	44,790	29,038	0.6	0.3
Nonprofit corporations and associations.....	.....	3,474,430	...	35.2
Individual and partnership.....	459,184	501,800	6.4	5.1
Corporations (profit unrestricted).....	.....	456,759	...	4.6
Industrial.....	91,166	.....	1.3	.....
Independent associations.....	2,714,406	.....	37.9	.....
Total nongovernmental.....	5,322,898	7,144,869	74.4	72.3
According to Type of Service:				
General.....	6,321,861	9,018,316	88.3	91.3
Nervous and mental.....	97,889	190,249	1.4	1.9
Tuberculosis.....	80,562	90,615	1.1	0.9
Maternity.....	91,466	59,381	1.3	0.6
Industrial.....	93,415	45,085	1.3	0.5
Eye, ear, nose and throat.....	113,762	99,291	1.6	1.0
Children's.....	83,416	95,137	1.2	1.0
.....	37,842	36,891	0.5	0.4
.....	40,210	30,270	0.6	0.3
Convalescent and rest.....	28,628	34,191	0.4	0.3
Hospital departments of institutions.....	131,291	169,927	1.8	1.6
All other hospitals.....	35,004	18,882	0.5	0.2

of patients admitted to all registered hospitals. Church centered hospitals number 1,001, a gain of twenty in the last year; 120,740 beds, a gain of 1,219; 18,044 bassinets, a gain of 724; 2,682,762 patients admitted, a gain of 150,966, and average census 81,984, a gain of 1,408. The fraternal hospitals lost two in number, declined in average census and remain nearly stationary in the numbers of beds, bassinets and patients admitted. Most conspicuous is the gain of those nonprofit corporations and associations that are independent and nonfraternal. These now have 1,783 hospitals, a gain of sixty-five; 168,562 beds, a gain of 2,709; 23,260 bassinets, a gain of 839; 3,474,430 patients admitted, a gain of 186,799, and their average census is 116,278, a gain of 1,860.

Passing to the proprietary group, table 1 C, we find a marked change during the last year. The total proprietary hospitals declined from 1,681 to 1,646, a loss of thirty-five. The number of beds dropped from 56,743 to 56,375, and the bassinets from 7,793 to 7,745; patients admitted dropped from 965,689 to 958,619; the average census increased from 30,885 to 31,109. The largest loss in the proprietary hospitals is in the group of corporations unrestricted as to profit—that is, they make a profit—commonly termed as incorporated for profit. Their number dropped during the year from 493 to 456, with corresponding reduction in beds, bassinets and patients admitted but slight increase in the average census of patients, as shown in table 1 C. The loss in these corporations unrestricted as to profit is largely due to changing over to the nonprofit classification. Individuals and partnerships gained two hospitals, lost in number of beds and the average census of patients, and made some gains in the number of bassinets and the number of patients admitted.

The total nongovernmental hospitals, as shown in the totals of tables 1 B and 1 C, number 4,486, an increase of forty-eight, and have 349,880 beds and 49,160 bassinets. Beds and bassinets both increased. They admitted 7,144,869 patients, a gain of 331,074, or nearly three times the gain made by the governmental hospitals. The average census rose from 229,019 to 232,435 during the year.

Idle beds in all nongovernmental hospitals averaged 117,445 in 1939 and 117,225 in 1938.

GENERAL HOSPITALS

As long as the annual census has been conducted, general hospitals have been doing an increasing proportion of the hospital work of the country. The Register lists 4,356 general hospitals as compared with 4,286 last year. This growth of seventy is due in part to

General Hospitals by Size

	Under 10 Beds	10-25	26-50	51-100	101-200	201-300	Over 300	Total
1939.....	78	1,146	1,085	891	650	253	233	4,356
1938.....	76	1,135	1,054	861	679	242	239	4,286

transfers from other classifications, but it is due more to the registration of new or practically new hospitals, many of which have been erected in areas where there was apparently a need for more general hospitals. The aggregate bed capacity of general hospitals is 444,947, an increase of 19,623 over last year. The bassinets in general hospitals showed an increase of 2,259. It is in the number of patients admitted that general hospitals have been showing an almost constant growth since that figure was first obtained in the year 1931. At that time the general hospitals admitted 88.3 per cent of the patients who went into all hospitals for that year.

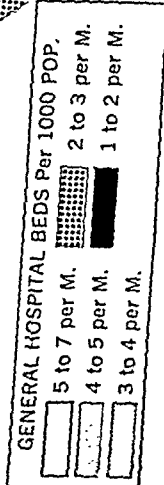
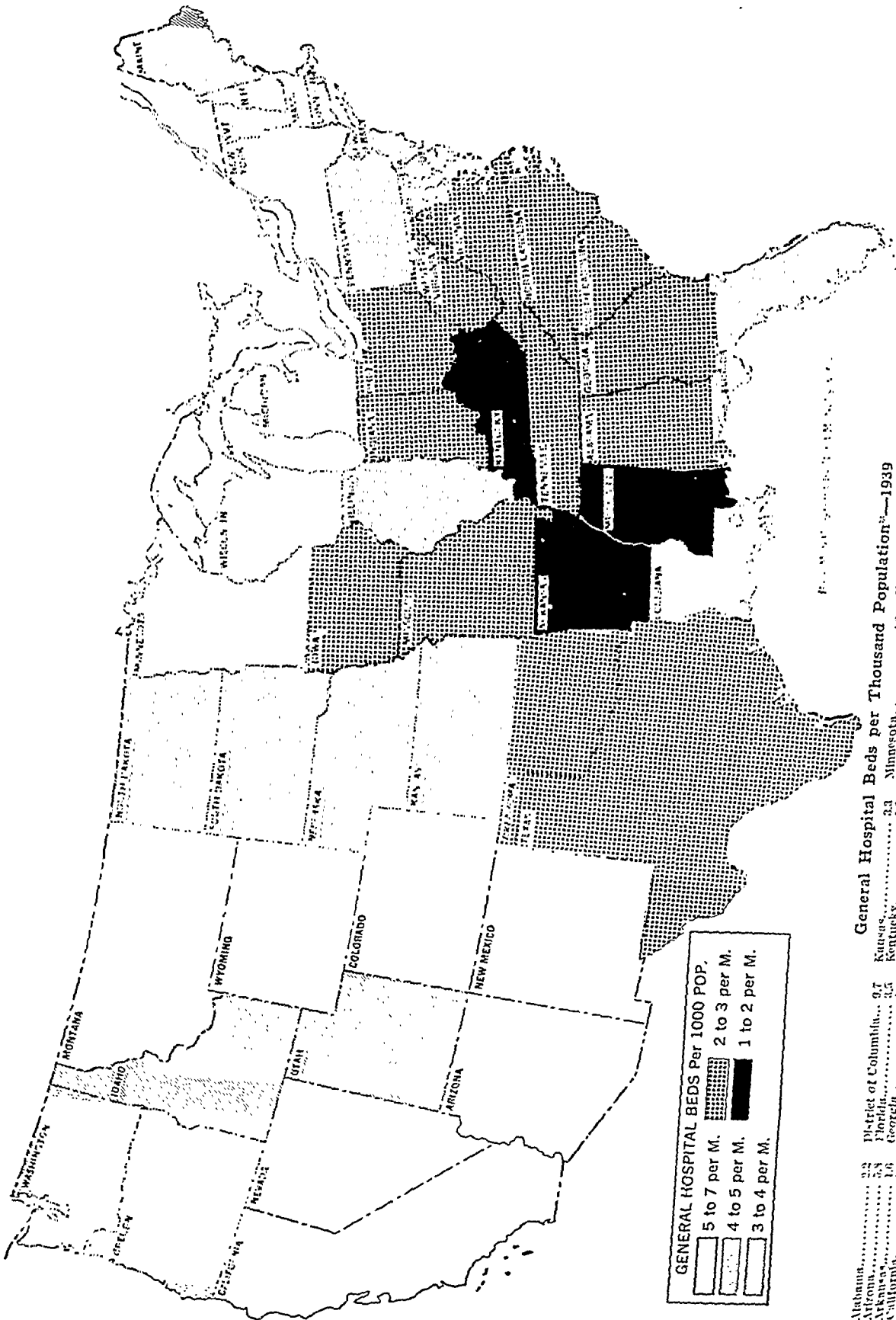
Analysis of General Hospitals by Control

	Hospitals	Beds	Bassinets	Patients Admitted	Average Census
Federal.....	266	52,529	816	440,674	39,896
State.....	53	19,980	1,111	323,472	15,627
County.....	221	35,662	2,443	527,011	27,497
City.....	221	49,035	4,186	897,396	38,296
City-county.....	41	6,218	578	119,368	4,164
Total governmental, general....	802	163,424	9,134	2,307,921	125,380
Church.....	812	108,616	16,864	2,633,609	72,358
.....	14	1,311	111	18,588	891
.....	1,386	132,527	21,765	3,172,489	89,000
Total nonprofit, general.....	2,272	242,454	38,740	5,824,686	162,849
Individual and partnership.....	937	21,825	4,392	463,661	9,868
Corporations (profit unrestricted).....	325	17,244	2,917	422,048	9,894
Total proprietary, general.....	1,262	39,069	7,309	885,709	19,762
Grand total, general hospitals..	4,336	444,947	55,183	9,018,316	307,991

The present census shows that total admissions to general hospitals number 9,018,316, or 91.3 per cent of the patients admitted to all hospitals. Their average census was 307,991, an increase of 15,121.

SUPPLY AND UTILIZATION OF BEDS IN
GENERAL HOSPITALS

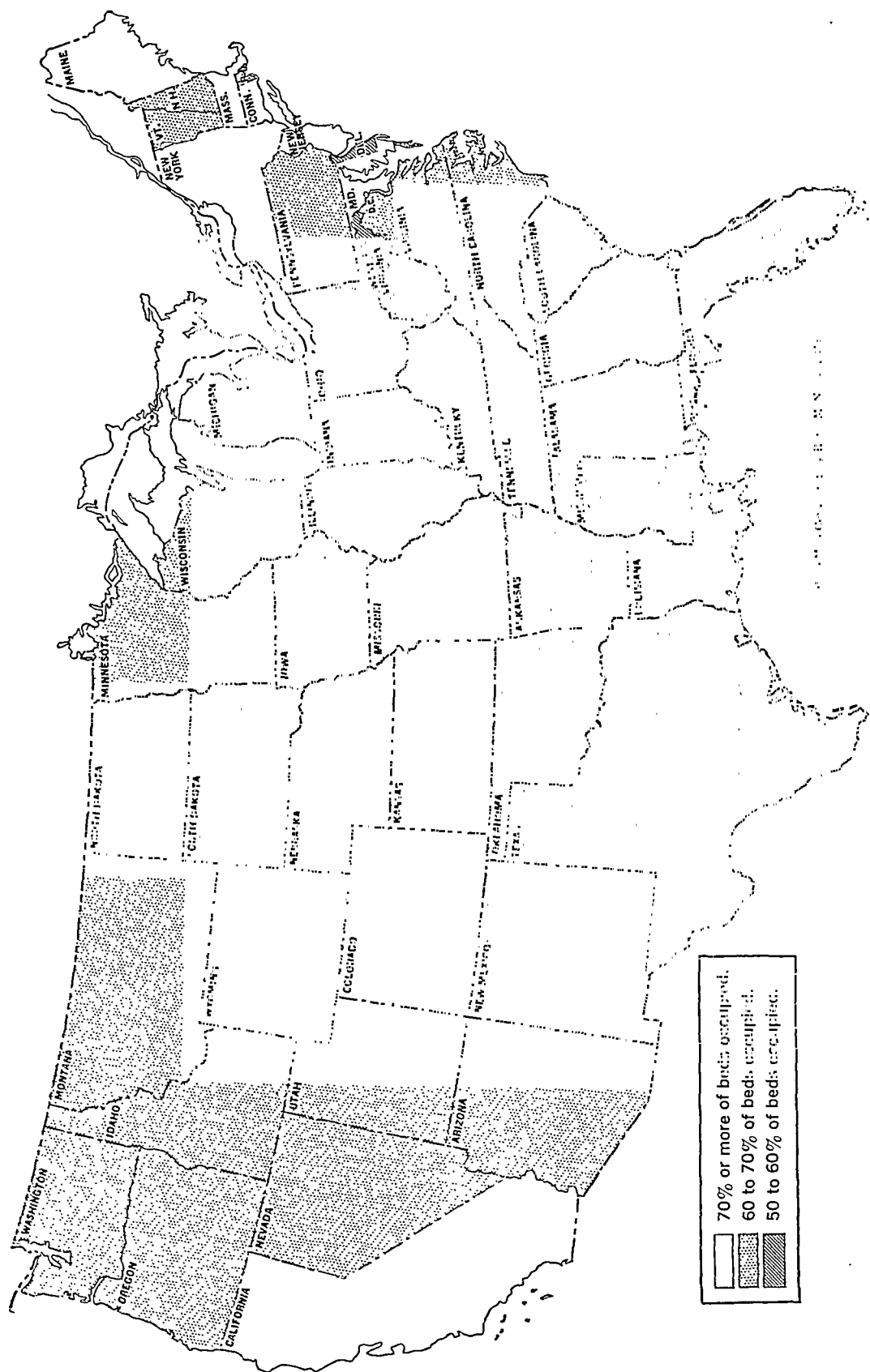
In the accompanying table the states are arranged in the order of the number of their general hospital beds per thousand of population. Mississippi and Arkansas, having the least hospital facilities, have 1.6 beds per thousand. At the other end of the scale, the District



GENERAL HOSPITAL BEDS PER THOUSAND POPULATION—1939

Alabama.....	2.2	District of Columbia.....	9.7
Alaska.....	2.3	Florida.....	3.5
Arizona.....	1.6	Georgia.....	3.5
Arkansas.....	2.4	Idaho.....	2.9
California.....	3.1	Iowa.....	3.5
Colorado.....	2.4	Illinois.....	3.5
Connecticut.....	3.7	Indiana.....	3.4
Delaware.....	3.4	Iowa.....	3.5
District of Columbia.....	9.7	Kansas.....	2.3
Florida.....	3.5	Kentucky.....	2.3
Georgia.....	3.5	Louisiana.....	1.3
Idaho.....	2.9	Maine.....	1.0
Illinois.....	3.5	Maryland.....	2.8
Indiana.....	3.4	Massachusetts.....	3.4
Iowa.....	3.5	Michigan.....	1.5
Kansas.....	2.3	Minnesota.....	1.5
Kentucky.....	2.3	Mississippi.....	1.5
Louisiana.....	1.3	Missouri.....	2.8
Maine.....	1.0	Montana.....	1.5
Maryland.....	2.8	Nebraska.....	2.8
Massachusetts.....	3.4	Nevada.....	1.5
Michigan.....	1.5	New Hampshire.....	1.5
Minnesota.....	1.5	New Jersey.....	4.2
Mississippi.....	1.5	New Mexico.....	1.5
Missouri.....	2.8	New York.....	5.5
Montana.....	1.5	North Carolina.....	2.3
Nebraska.....	2.8	North Dakota.....	2.3
Nevada.....	1.5	Ohio.....	2.3
New Hampshire.....	1.5	Oklahoma.....	2.3
New Jersey.....	4.2	Oregon.....	2.3
New Mexico.....	1.5	Pennsylvania.....	4.1
New York.....	5.5	Rhode Island.....	3.1
North Carolina.....	2.3	South Carolina.....	2.3
North Dakota.....	2.3	South Dakota.....	2.3
Ohio.....	2.3	Tennessee.....	2.3
Oklahoma.....	2.3	Texas.....	2.3
Oregon.....	2.3	Vermont.....	2.3
Pennsylvania.....	4.1	Virginia.....	2.3
Rhode Island.....	3.1	West Virginia.....	2.3
South Carolina.....	2.3	Wisconsin.....	2.3
South Dakota.....	2.3	Wyoming.....	2.3
Tennessee.....	2.3		
Texas.....	2.3		
Vermont.....	2.3		
Virginia.....	2.3		
West Virginia.....	2.3		
Wisconsin.....	2.3		
Wyoming.....	2.3		

* Population as estimated by the United States Bureau of Census, July 1, 1937.



OCCUPANCY IN GENERAL HOSPITALS

The percentages of beds occupied in general hospitals during the year 1939, by states, were as follows:

Alabama.....	67.9	Delaware.....	58.5
Arizona.....	62.4	District of Columbia..	79.1
Arkansas.....	53.3	Florida.....	53.8
California.....	75.0	Georgia.....	60.3
Colorado.....	62.5	Idaho.....	62.8
Connecticut.....	71.5	Illinois.....	70.2
Delaware.....	58.5	Indiana.....	73.0
		Iowa.....	68.2
		Kansas.....	69.8
		Kentucky.....	54.4
		Louisiana.....	68.6
		Maine.....	61.8
		Maryland.....	69.2
		Massachusetts.....	62.6
		Michigan.....	71.2
		Minnesota.....	63.1
		Mississippi.....	60.3
		Missouri.....	65.2
		Montana.....	68.2
		Nebraska.....	60.2
		Nevada.....	62.0
		New Hampshire.....	62.9
		New Jersey.....	69.8
		New Mexico.....	54.4
		New York.....	70.0
		North Carolina.....	62.8
		North Dakota.....	59.7
		Ohio.....	71.2
		Oklahoma.....	59.7
		Oregon.....	74.3
		Pennsylvania.....	67.4
		Rhode Island.....	63.6
		South Carolina.....	60.7
		South Dakota.....	58.9
		Tennessee.....	68.6
		Texas.....	55.2
		Utah.....	61.2
		Vermont.....	69.8
		Virginia.....	64.7
		Washington.....	67.9
		West Virginia.....	53.1
		Wisconsin.....	64.7
		Wyoming.....	59.0

of Columbia has 9.7 beds per thousand, many of which, however, serve not only the inhabitants of the District but federal employees throughout the country.

Separating the states into groups having hospital facilities in the ratio of 1 to 2, 2 to 3, 3 to 4, and so on, beds per thousand, the utilization of these facilities (per cent of occupancy) in each group steadily rises as the number of hospital beds increases. Three states with from 1 to 2 beds per thousand show a use of 58.1 per

Supply and Utilization of Beds in General Hospitals Ranked According to Beds Per Thousand of Population

State	Beds per Thousand Population	Per Cent of Occupancy	Group Average
Mississippi.....	1.6	54.4	58.1
Arkansas.....	1.6	58.3	
Kentucky.....	1.8	60.3	
Georgia.....	2.0	62.8	65.1
North Carolina.....	2.1	65.8	
South Carolina.....	2.1	69.7	
Tennessee.....	2.1	68.6	
Alabama.....	2.2	67.9	
Oklahoma.....	2.3	59.7	
Indiana.....	2.4	67.0	
Texas.....	2.4	55.2	
Missouri.....	2.8	68.6	
Iowa.....	2.8	64.1	
West Virginia.....	2.8	58.1	
Virginia.....	2.9	64.7	67.8
Ohio.....	2.9	71.2	
New Jersey.....	3.0	74.3	
Kansas.....	3.3	63.1	
Nebraska.....	3.3	60.2	
Idaho.....	3.3	61.2	
Maine.....	3.4	70.2	
Pennsylvania.....	3.4	69.8	
Illinois.....	3.5	68.2	
Florida.....	3.5	58.8	
North Dakota.....	3.6	58.7	
South Dakota.....	3.6	58.8	
Connecticut.....	3.7	71.5	73.1
Utah.....	3.7	61.2	
Vermont.....	3.7	68.6	
Delaware.....	3.9	58.5	
Louisiana.....	4.0	68.2	
Oregon.....	4.1	67.4	
Wisconsin.....	4.1	64.7	
Minnesota.....	4.2	69.8	
Washington.....	4.3	67.9	
New Hampshire.....	4.4	62.0	
Maryland.....	4.5	73.0	
Michigan.....	4.5	71.2	70.7
New York.....	4.5	79.0	
Rhode Island.....	4.6	65.6	
Massachusetts.....	4.9	72.3	
Wyoming.....	5.0	59.6	
California.....	5.3	75.0	
New Mexico.....	5.3	55.6	
Colorado.....	5.4	62.5	
Montana.....	5.6	61.8	
Arizona.....	5.8	62.4	
Nevada.....	6.0	62.6	62.6
District of Columbia.....	9.7	79.1	79.1

Population estimated by the United States Bureau of Census, July 1, 1937.

cent. The next group, thirteen states, with hospital beds running from 2 to 3 per thousand, report 65.1 per cent occupancy. The next group, fourteen states with a ratio of from 3 to 4 beds per thousand, keep these beds 67.8 per cent filled. In eleven states, with from 4 to 5 beds per thousand, utilization is 73.1 per cent. In six states having from 5 to 6 beds per thousand, occupancy drops to 70.7 per cent.

Hospital facilities obviously are most used where they are most abundant, and where the ratio of beds to population is lowest the rate of occupancy is also lowest. In other words, hospitals have been built in response to a community demand and have not, as a rule, been built where there is no demand.

Doubtless some states would show a higher rate of occupancy if additional funds were available for hospitalization of the indigent. In other states, education is needed to overcome popular prejudice. In any case, no single formula for hospital facilities is applicable to all parts of the country or to the habits and customs of all the people.

In determining whether and where there is need of additional hospital facilities, it is obviously necessary first to ascertain the extent to which existing facilities are being utilized.

NERVOUS AND MENTAL HOSPITALS

There are 600 nervous and mental hospitals as compared with 592 a year ago; the capacity increased from 591,822 to 606,284. However, the number of patients admitted shows a slight decline, being 190,249 as compared with 198,703 last year. The decrease in number of patients admitted is, without doubt, due to the still inadequate capacity of mental hospitals to accommodate those who should enter. In spite of a sizable increase in the number of beds in mental hospitals during the past few years there is still a large waiting list in a number of states. The capacity of the mental hospitals as given in the Register is usually the number of beds set up for use and not necessarily the proper capacity for which the buildings were designed. The average census of patients in mental hospitals was 577,103 as compared with 562,337 a year ago.

TUBERCULOSIS AND OTHER SPECIAL HOSPITALS

The Register accounts for 480 tuberculosis hospitals with a bed capacity of 75,972. It is borne in mind, of course, that the tuberculosis departments of general hospitals, and other hospitals not designed primarily for tuberculosis, take care of a great many patients and an increasing number of patients suffering from tuberculosis. The most complete and satisfactory picture of the hospitalization of tuberculous patients is presented in the special Tuberculosis Number of THE JOURNAL, March 2, 1940.

Maternity hospitals declined during the year from 120 to 118 and there was also a slight falling off in beds, bassinets, patients admitted and average census.

Industrial hospitals grew from thirty-seven to forty and showed an increase in capacity, patients admitted and average census.

Eye, ear, nose and throat hospitals likewise increased from thirty-eight to forty-one and the bed capacity from 1,992 to 2,467, an unusual increase. They admitted 99,291 patients and their average census was higher than that of last year.

Children's hospitals exhibit no marked change in figures but admitted 95,137 patients as compared with 93,420 the preceding year.

Orthopedic hospitals increased from seventy-five to eighty-two, the bed capacity having gone up from 7,125 to 7,706. There was a corresponding increase in the occupancy figures.

The number of isolation hospitals has risen from fifty-four to sixty, the first such increase in thirteen years. They remained about stationary in the occupancy figures.

The increase from 121 to 139 in the number of convalescent and rest hospitals is due largely to reclassification of other institutions, particularly hospitals for the incurable that had gradually changed so as to require reclassification under convalescent and rest. The number of patients admitted to the con-

Table 1.—HOSPITAL FACILITIES BY STATES AND BY CONTROL. A. GOVERNMENT HOSPITALS

Marital No.	Federal	State				County				City				City-County				Total Governmental				Marital No.
		Hospitals	Beds	Basinets	Patients Admitted	Average	Hospitals	Beds	Basinets	Patients Admitted	Average	Hospitals	Beds	Basinets	Patients Admitted	Average	Hospitals	Beds	Basinets	Patients Admitted	Average	
1	Alabama.....	6	9,466	1,570	5,570	62.9	6	618	39	14,693	575	2	100	16	2,464	59	24	977	102	337	27	6,063
2	Arizona.....	6	1,637	1,063	1,570	62.9	6	618	39	14,693	575	2	100	16	2,464	59	24	977	102	337	27	6,063
3	Arkansas.....	6	5,933	2,063	5,463	4.80	1	465	43	6,321	236	2	100	12	1,761	36	12	7,618	55	15,140	7,027	2
4	California.....	20	2,010	27,000	20,603	27,000	51	17,737	238	177,133	15,000	2	47	14	1,306	22	93	63,623	710	23,491	50,463	4
5	Colorado.....	1	2,118	1,712	2,008	4,712	3	214	31	4,080	146	4	868	41	0,078	542	19	8,074	110	23,491	6,873	5
6	Connecticut.....	1	2,027	1,192	1,192	1,837	1	202	1	1,192	1,837	1	202	1	1,192	1,837	19	11,520	50	13,800	10,691	6
7	Delaware.....	5	2,027	1,192	1,192	1,837	1	202	1	1,192	1,837	1	202	1	1,192	1,837	19	11,520	50	13,800	10,691	7
8	Dist. of Columbia.....	5	2,027	1,192	1,192	1,837	1	202	1	1,192	1,837	1	202	1	1,192	1,837	13	12,113	188	44,629	10,801	8
9	Florida.....	7	7,791	7,791	7,791	5,799	9	983	65	14,050	892	5	2,575	115	17,658	9,115	31	9,164	195	63,105	7,633	9
10	Georgia.....	6	7,717	7,717	7,717	7,717	5	262	28	6,024	197	7	1,213	138	36,240	903	32	24,419	237	71,295	11,426	10
11	Idaho.....	1	1,700	1,700	1,700	1,700	5	262	28	6,024	197	7	1,213	138	36,240	903	32	24,419	237	71,295	11,426	11
12	Illinois.....	60	42,003	38,003	38,003	38,003	22	6,192	261	87,455	5,888	21	3,748	152	27,676	492	72	67,751	459	167,130	61,111	12
13	Indiana.....	60	42,003	38,003	38,003	38,003	22	6,192	261	87,455	5,888	21	3,748	152	27,676	492	72	67,751	459	167,130	61,111	13
14	Iowa.....	17	12,111	12,111	12,111	12,111	12	771	52	10,560	1,600	8	248	40	5,811	140	35	14,597	174	50,317	13,425	14
15	Kansas.....	12	12,111	12,111	12,111	12,111	6	287	40	4,650	171	8	248	40	5,811	140	35	14,597	174	50,317	13,425	15
16	Kentucky.....	12	12,111	12,111	12,111	12,111	6	287	40	4,650	171	8	248	40	5,811	140	35	14,597	174	50,317	13,425	16
17	Louisiana.....	7	7,717	7,717	7,717	7,717	8	221	15	2,725	169	1	703	85	15,372	482	25	11,421	33	33,883	10,588	17
18	Maine.....	4	1,834	1,834	1,834	1,834	1	100	20	2,725	169	1	703	85	15,372	482	14	13,567	200	110,482	11,584	18
19	Maryland.....	4	1,834	1,834	1,834	1,834	1	100	20	2,725	169	1	703	85	15,372	482	13	13,567	200	110,482	11,584	19
20	Massachusetts.....	13	9,637	9,637	9,637	9,637	3	110	20	1,901	1,911	2	236	20	2,725	169	27	13,642	172	40,657	12,414	20
21	Michigan.....	28	24,419	24,419	24,419	24,419	28	1,093	53	24,419	24,419	28	1,093	53	24,419	24,419	90	45,687	451	116,925	40,867	21
22	Minnesota.....	8	1,834	1,834	1,834	1,834	16	1,687	23	5,670	1,488	12	4,567	40	71,075	3,618	90	45,687	451	116,925	40,867	22
23	Mississippi.....	12	12,111	12,111	12,111	12,111	5	392	40	6,375	200	16	787	216	52,382	6,028	24	21,864	312	21,037	19,507	23
24	Missouri.....	11	12,003	11,908	11,908	11,908	4	392	40	6,375	200	16	787	216	52,382	6,028	36	21,864	312	21,037	19,507	24
25	Montana.....	4	1,834	1,834	1,834	1,834	1	100	20	1,901	1,911	2	236	20	2,725	169	18	13,567	200	110,482	11,584	25
26	Nebraska.....	5	3,617	3,617	3,617	3,617	1	400	28	2,938	314	4	236	33	4,059	118	13	13,567	200	110,482	11,584	26
27	Nevada.....	1	1,834	1,834	1,834	1,834	6	378	30	3,444	230	2	186	15	1,886	60	11	13,567	200	110,482	11,584	27
28	New Hampshire.....	3	3,617	3,617	3,617	3,617	23	10,347	234	10,716	6,666	10	2,588	57	38,551	2,042	22	13,567	200	110,482	11,584	28
29	New Jersey.....	10	10,347	10,347	10,347	10,347	44	7,073	113	27,669	5,690	47	2,716	1,134	316,183	21,161	22	13,567	200	110,482	11,584	29
30	New Mexico.....	6	1,305	1,305	1,305	1,305	15	939	39	3,663	780	4	378	35	5,832	249	164	13,567	200	110,482	11,584	30
31	New York.....	48	9,713	40	30,132	62,141	44	7,073	113	27,669	5,690	47	2,716	1,134	316,183	21,161	241	13,567	200	110,482	11,584	31
32	North Carolina.....	4	8,783	4	4,333	3,091	23	3,601	69	11,937	3,044	1	16	25	1	14	3	13,567	200	110,482	11,584	32
33	North Dakota.....	22	20,954	26	22,045	26,321	3	145	18	2,068	65	5	187	24	4,049	70	18	13,567	200	110,482	11,584	33
34	Ohio.....	13	10,179	24	14,977	9,881	2	145	18	2,068	65	5	187	24	4,049	70	36	12,585	157	40,102	14,294	34
35	Oklahoma.....	34	32,246	162	63,618	20,953	18	10,088	4	3,039	9,184	10	8,823	66	30,847	6,512	87	13,567	200	110,482	11,584	35
36	Oregon.....	4	4,543	21	2,049	4,815	10	953	81	19,790	775	1	205	1	1,972	185	18	13,567	200	110,482	11,584	36
37	Rhode Island.....	3	3,617	3,617	3,617	3,617	10	953	81	19,790	775	1	205	1	1,972	185	7	13,567	200	110,482	11,584	37
38	South Carolina.....	4	4,543	21	2,049	4,815	10	953	81	19,790	775	1	205	1	1,972	185	7	13,567	200	110,482	11,584	38
39	South Dakota.....	1	1,834	1,834	1,834	1,834	10	953	81	19,790	775	1	205	1	1,972	185	7	13,567	200	110,482	11,584	39
40	Tennessee.....	11	7,083	41	9,810	632	3	145	18	2,068	65	5	187	24	4,049	70	19	13,567	200	110,482	11,584	40
41	Texas.....	14	3,617	30	22,816	2,825	17	920	10	15,574	551	3	1,008	130	31,296	857	24	11,470	222	57,743	10,573	41
42	Utah.....	3	3,617	3,617	3,617	3,617	3	201	39	5,514	177	3	86	32	1,704	46	66	23,891	354	108,477	22,218	42
43	Vermont.....	5	1,621	1,621	1,621	1,621	2	83	12	1,825	44	5	1,033	57	3,557	704	7	13,567	200	110,482	11,584	43
44	Virginia.....	14	12,044	44	15,519	11,008	2	83	12	1,825	44	5	1,033	57	3,557	704	20	16,093	143	37,449	14,622	44
45	Washington.....	1	2,019	20	2,019	2,019	3	145	18	2,068	65	5	187	24	4,049	70	35	13,567	200	110,482	11,584	45
46	West Virginia.....	12	5,470	16	8,553	4,066	4	177	12	1,872	120	1	165	20	2,452	70	35	13,567	200	110,482	11,584	46
47	Wisconsin.....	4	1,834	1,834	1,834	1,834	61	14,185	91	26,315	13,010	12	709	95	14,542	224	88	21,937	239	67,373	19,025	47
48	Wyoming.....	4	1,143	13	2,837	1,019	4	302	53	8,016	108	1	100	16	2,464	59	17	13,567	200	110,482	11,584	48
49	Totals (1929).....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	50
50	Alabama.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	50
51	Arizona.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	51
52	Arkansas.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	52
53	California.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	53
54	Colorado.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	54
55	Connecticut.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	55
56	Delaware.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	56
57	Dist. of Columbia.....	523	560,575	1,224	588,597	527,000	501	100,976	2,748	380,266	80,767	320	77,231	4,210	951,295	61,766	67	10,026	580	127,389	7,513	57
58	Florida.....	523	560,575	1,224																		

valescent and rest institutions declined from 36,265 to 34,191. The average census, at the same time, increased from 4,305 to 6,948.

Institutional hospitals, or the hospital departments of institutions, registered a decline in number but had a considerable increase in bed capacity. Their patients admitted were 160,927 and the average census rose

or highly specialized purposes find it expedient to take an increasing number of other types of patients until they gradually become, in fact, general hospitals.

In large cities all the institutions operated by the municipality are commonly united under one head for administrative purposes. In such cases the statistics available on the different types of hospitals operated by

TABLE 1.—HOSPITAL FACILITIES BY STATES AND BY CONTROL.
B. NONPROFIT ORGANIZATIONS

Marginal No.	Church					Fraternal					Nonprofit Corporations and Associations					Total Nonprofit					Marginal No.	
	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census		
1	Alabama.....	8	729	99	22,477	494	..	..	..	..	20	1,389	133	32,412	801	28	2,118	232	54,889	1,288	1	
2	Arizona.....	8	833	90	17,778	494	1	25	..	20	14	13	521	53	6,991	250	22	1,379	143	24,789	738	2
3	Arkansas.....	10	1,071	125	22,700	600	2	100	11	1,413	56	11	681	60	13,674	362	23	1,852	196	37,787	1,018	3
4	California.....	43	5,377	885	137,988	3,858	3	330	10	4,035	266	75	6,431	892	141,397	4,639	121	12,141	1,787	283,420	8,733	4
5	Colorado.....	28	2,672	356	49,609	1,632	3	171	..	118	90	23	1,971	93	14,514	1,262	53	4,814	449	64,241	2,945	5
6	Connecticut.....	7	1,635	277	43,736	1,201	..	..	..	..	..	37	5,093	735	102,272	3,777	44	6,728	1,012	146,008	4,978	6
7	Delaware.....	1	104	31	2,049	52	..	..	..	..	..	7	819	150	17,738	478	8	923	181	19,787	539	7
8	Dist. Columbia..	4	889	132	24,789	691	..	..	..	..	..	10	1,663	296	42,318	1,321	14	2,552	448	67,107	2,012	8
9	Florida.....	7	780	135	17,706	456	3	175	4	1,080	111	26	1,342	200	23,647	642	36	2,297	339	42,333	1,299	9
10	Georgia.....	7	689	88	16,692	408	1	60	..	283	60	18	1,269	168	30,706	788	26	1,918	256	47,681	1,256	10
11	Idaho.....	10	692	153	16,948	459	..	..	..	..	..	3	69	17	830	87	13	761	170	17,778	476	11
12	Illinois.....	88	11,876	1,953	271,232	7,616	4	339	25	6,127	238	86	8,986	1,509	208,478	5,958	178	21,201	3,487	485,827	13,812	12
13	Indiana.....	30	4,068	667	106,368	2,681	1	82	..	90	65	20	1,291	228	32,188	813	51	5,441	895	133,646	3,530	13
14	Iowa.....	41	3,945	607	88,005	2,573	1	55	..	12	44	25	1,202	218	24,426	669	67	5,202	825	112,443	3,266	14
15	Kansas.....	39	3,130	487	65,302	1,959	..	..	..	..	..	25	841	150	16,137	430	64	3,971	637	81,429	2,389	15
16	Kentucky.....	12	1,725	225	44,612	1,257	1	24	..	88	20	31	1,862	192	31,518	978	44	3,611	417	76,218	2,253	16
17	Louisiana.....	10	1,667	150	41,925	1,083	2	123	12	1,537	87	18	1,472	108	27,324	759	30	3,162	270	70,786	1,929	17
18	Maine.....	5	367	48	9,435	276	..	..	..	..	..	26	1,593	255	32,934	1,158	31	1,960	303	42,369	1,434	18
19	Maryland.....	9	2,049	186	34,366	1,674	..	..	..	..	..	30	4,035	385	63,160	2,999	39	6,084	571	97,626	4,653	19
20	Massachusetts....	16	2,627	430	54,581	2,013	1	60	..	383	61	119	11,554	1,832	231,587	8,118	136	14,241	2,282	286,551	10,192	20
21	Michigan.....	34	4,336	770	106,883	2,963	2	170	..	319	140	67	6,861	936	144,253	4,540	103	11,367	1,756	251,455	7,643	21
22	Minnesota.....	38	3,741	566	91,594	2,711	1	60	..	160	61	46	2,768	499	74,694	1,908	85	6,569	1,065	166,418	4,690	22
23	Mississippi.....	2	230	32	7,342	135	..	..	..	..	..	31	1,161	160	28,783	584	33	1,291	182	36,125	719	23
24	Missouri.....	41	5,884	734	114,907	4,132	3	308	..	1,372	228	30	2,553	369	44,113	1,557	74	8,745	1,043	160,392	5,017	24
25	Montana.....	23	1,831	322	35,468	1,103	..	..	..	..	..	7	274	36	5,350	160	30	2,105	358	40,818	1,263	25
26	Nebraska.....	28	2,484	361	51,270	1,618	..	..	..	..	..	6	220	39	5,692	115	34	2,704	400	56,062	1,633	26
27	Nevada.....	1	75	15	1,894	61	..	..	..	..	..	2	60	10	700	29	3	135	25	2,594	60	27
28	New Hampshire....	5	351	63	8,098	233	..	..	..	..	..	26	1,459	267	28,238	863	31	1,810	330	36,336	1,096	28
29	New Jersey.....	18	3,337	442	70,458	2,268	1	100	..	111	45	74	9,240	1,430	197,994	6,794	93	12,677	1,872	268,563	9,107	29
30	New Mexico.....	13	824	96	12,661	456	1	46	..	35	46	11	402	34	3,017	150	25	1,272	130	16,613	601	30
31	New York.....	81	12,263	1,638	206,199	9,384	4	428	6	1,163	291	220	31,805	4,124	631,760	23,086	305	44,496	5,768	839,122	33,691	31
32	North Carolina....	16	1,127	154	30,051	831	1	20	..	10	12	75	4,696	554	118,136	2,992	92	5,643	708	148,197	3,335	32
33	North Dakota....	23	1,772	299	40,429	1,075	..	..	..	..	..	8	366	60	7,465	178	31	2,078	329	47,891	1,251	33
34	Ohio.....	44	6,932	1,039	108,926	5,068	4	445	..	1,795	309	94	8,090	1,178	193,758	5,452	142	15,467	2,217	364,479	10,829	34
35	Oklahoma.....	8	851	159	24,134	549	2	81	13	1,816	41	8	302	41	6,298	158	18	1,234	213	32,218	745	35
36	Oregon.....	18	2,015	308	55,636	1,413	1	50	..	288	53	10	469	87	6,951	252	29	2,534	395	69,875	1,718	36
37	Pennsylvania.....	40	6,439	879	116,098	4,800	5	389	..	1,455	345	193	26,033	3,285	488,734	18,958	238	32,801	4,164	606,287	23,653	37
38	Rhode Island.....	3	451	43	5,413	292	..	..	..	..	..	13	1,903	338	31,828	1,239	16	2,336	381	37,241	1,131	38
39	South Carolina....	6	441	59	10,869	273	2	87	2	533	71	24	1,062	184	41,729	1,070	32	2,190	245	53,131	1,414	39
40	South Dakota....	14	1,050	183	24,622	672	..	..	..	..	..	10	365	70	8,474	210	24	1,415	262	33,006	882	40
41	Tennessee.....	8	1,224	149	38,332	860	..	..	..	..	..	25	1,929	214	33,133	1,343	33	3,153	363	71,465	2,263	41
42	Texas.....	47	4,369	677	126,399	2,597	4	296	13	1,949	199	41	2,065	185	46,823	1,064	92	6,730	875	175,171	7,507	42
43	Utah.....	6	979	206	22,614	674	1	20	..	69	20	7	287	82	7,154	103	14	1,286	288	29,837	797	43
44	Vermont.....	3	215	31	5,152	183	..	..	..	..	..	16	989	160	20,978	636	10	1,201	191	26,129	569	44
45	Virginia.....	3	352	38	6,361	168	1	135	15	2,677	71	40	3,148	356	76,541	2,069	44	3,353	469	85,579	2,268	45
46	Washington.....	21	2,542	454	55,858	1,506	1	24	..	120	20	25	1,746	353	47,100	1,432	47	4,442	607	103,088	2,658	46
47	West Virginia....	9	1,000	121	19,742	512	..	..	..	..	..	17	1,464	167	30,243	952	26	2,464	288	49,955	1,464	47
48	Wisconsin.....	63	6,853	1,052	138,058	4,488	..	..	..	..	..	31	2,068	334	47,007	1,203	94	8,863	1,386	185,965	5,691	48
49	Wyoming.....	2	45	10	956	22	..	..	..	..	..	3	78	15	1,533	30	5	123	25	2,519	52	49
50	Totals (1920)....	1,001	120,740	18,644	2,682,762	81,884	56	4,203	111	29,038	3,064	1,783	168,562	23,260	3,474,430	116,278	2,840	293,505	41,415	6,156,229	201,236	50
51	(1925).....	981	119,521	17,320	2,531,796	80,576	58	4,127	102	28,670	3,140	1,718	165,833	22,421	3,287,631	114,418	2,757	289,501	39,813	5,848,106	198,134	51
52	(1937).....	975	115,283	16,851	2,495,114	79,113	61	4,789	128	32,125	3,205	1,657	157,688	21,383	3,168,917	111,303	2,693	277,737	38,262	5,696,126	193,621	52
53	(1920).....	969	133,208	16,269	2,286,064	74,037	64	4,938	116	23,057	3,341	1,678	157,650	21,122	2,939,651	104,109	2,711	275,874	37,593	5,258,772	181,517	53
54	(1925).....	970	113,268	16,034	1,950,308	69,592	69	5,360	141	33,926	3,620	1,691	149,940	19,978	2,493,281	94,468	2,610	268,568	36,152	4,477,515	167,669	54
55	(1934).....	970	113,263	16,067	1,786,522	63,851	72	5,411	150	34,700	3,601	1,694	149,038	20,034	2,342,513	89,615	2,616	267,712	36,251	4,473,733	157,679	55
56	(1923).....	984	115,840	16,190	1,753,565	63,621	72	5,299	132	26,517	<											

DEPARTMENTS OF PATHOLOGY

In the five years from 1934 to 1939 departments of pathology established in hospitals advanced from 4,271 to 4,873; departments in charge of physician-directors rose from 2,950 to 3,599.

There is a considerable number of hospitals that do not afford the services of a physician-pathologist and

SUPERINTENDENTS OR ADMINISTRATORS

Of the 6,226 registered hospitals, 2,189 have physicians as superintendents or administrators, 2,375 have nurses, and 1,662 have persons that have neither the M.D. or R.N. degree. In 1933, physicians were administrators in 2,312 hospitals, nurses in 2,559 and lay persons in 1,548.

Table 1.—HOSPITAL FACILITIES BY STATES AND BY CONTROL
C. PROPRIETARY

Marginal No.		Individual and Partnership					Corporations (Profit unrestricted)					Total Proprietary					Totals of Tables 1B and 1C					Marginal No.
		Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	
1	Alabama.....	32	1,116	135	20,612	477	6	349	45	7,561	174	38	1,465	180	28,203	651	66	3,583	412	83,082	1,949	1
2	Arizona.....	8	171	9	1,016	104	..	..	..	..	..	..	171	9	1,016	104	30	1,550	152	25,805	862	2
3	Arkansas.....	21	507	66	9,905	193	4	123	21	2,305	29	25	630	87	12,213	222	48	2,482	283	50,000	1,240	3
4	California.....	104	3,272	486	48,616	2,035	40	2,467	314	45,607	1,580	144	5,739	800	94,223	3,615	205	17,880	2,557	377,613	12,378	4
5	Colorado.....	23	537	75	7,332	325	5	302	11	1,874	133	28	839	86	9,206	461	81	5,633	535	73,447	3,445	5
6	Connecticut.....	8	233	..	1,130	139	10	582	..	1,010	403	18	865	..	2,140	542	62	7,593	1,012	148,148	5,520	6
7	Delaware.....	..	..	..	..	..	1	15	6	238	7	1	15	6	238	7	9	938	187	20,025	537	7
8	Dist. Columbia..	1	22	..	75	10	..	..	..	..	..	1	22	..	75	10	15	2,574	448	67,182	2,022	8
9	Florida.....	26	756	112	11,524	272	4	125	26	3,105	60	30	881	138	14,629	332	66	3,178	477	56,962	1,541	9
10	Georgia.....	43	1,173	137	25,090	609	11	515	69	13,231	262	54	1,688	206	38,330	871	80	3,606	462	86,011	2,127	10
11	Idaho.....	16	493	76	7,782	176	2	40	12	879	23	18	443	88	8,661	199	31	1,204	258	26,439	695	11
12	Illinois.....	34	817	108	8,973	450	17	1,356	138	10,437	794	51	2,173	246	28,430	1,244	229	23,374	3,733	514,267	15,056	12
13	Indiana.....	16	291	79	6,006	135	8	632	24	6,546	275	24	923	103	12,552	410	75	6,464	998	151,193	3,909	13
14	Iowa.....	26	582	132	10,315	291	7	267	38	4,500	147	43	849	170	14,815	438	110	6,051	995	127,253	3,724	14
15	Kansas.....	17	290	50	5,209	139	4	173	18	2,308	107	21	463	68	7,517	246	85	4,434	705	88,956	2,635	15
16	Kentucky.....	13	347	33	4,791	163	13	436	46	10,112	223	26	783	79	14,903	380	70	4,394	496	91,121	2,641	16
17	Louisiana.....	20	444	59	8,873	169	8	439	57	13,356	260	28	833	116	22,229	429	58	4,045	386	93,015	2,338	17
18	Maine.....	10	200	44	2,886	94	8	307	46	5,455	179	18	507	90	8,341	273	49	2,467	393	50,710	1,707	18
19	Maryland.....	11	391	9	1,897	235	3	235	40	3,774	119	14	626	49	5,071	404	53	6,710	620	103,397	5,077	19
20	Massachusetts....	22	522	81	5,741	273	17	951	184	15,615	589	39	1,473	265	21,556	862	175	15,714	2,547	308,107	11,054	20
21	Michigan.....	34	827	134	15,424	495	6	331	5	1,630	269	40	1,158	139	17,054	764	143	12,825	1,895	268,509	8,407	21
22	Minnesota.....	60	1,013	251	18,471	480	13	890	56	23,826	591	73	1,903	307	42,297	1,071	158	8,472	1,372	208,745	5,751	22
23	Mississippi.....	37	979	136	20,312	440	3	112	14	2,561	50	40	1,091	150	22,573	490	73	2,482	342	58,998	1,209	23
24	Missouri.....	27	755	174	10,457	349	8	297	44	2,781	169	35	1,032	218	12,238	518	109	9,797	1,261	173,630	6,335	24
25	Montana.....	9	174	47	3,489	75	3	172	20	3,473	81	12	346	67	6,902	156	42	2,451	425	47,780	1,419	25
26	Nebraska.....	43	679	182	12,030	276	3	160	18	1,152	122	46	839	200	13,232	398	80	3,434	600	70,194	2,031	26
27	Nevada.....	..	..	..	..	..	1	35	11	1,076	24	1	35	11	1,076	24	4	170	36	3,670	114	27
28	New Hampshire....	..	..	..	..	..	2	186	25	2,363	116	2	186	25	2,363	116	33	1,996	355	38,699	1,242	28
29	New Jersey.....	11	252	21	2,324	163	9	448	2	950	264	20	700	23	3,274	427	113	13,377	1,895	271,397	9,574	29
30	New Mexico.....	7	140	27	2,688	42	1	20	3	261	5	8	160	30	2,949	47	33	1,432	160	19,562	703	30
31	New York.....	66	2,008	457	24,814	1,194	42	3,922	638	65,631	2,537	108	5,930	1,095	90,445	3,731	413	60,426	6,863	929,567	37,392	31
32	North Carolina...	23	609	54	10,821	301	16	723	65	13,715	408	39	1,332	119	24,536	709	131	7,175	827	172,733	4,544	32
33	North Dakota...	6	108	32	2,092	51	1	16	4	343	8	9	124	36	2,435	59	40	2,202	395	50,829	1,312	33
34	Ohio.....	19	690	45	7,230	417	16	1,117	30	3,856	836	35	1,807	75	11,086	1,253	177	17,774	2,292	375,655	12,882	34
35	Oklahoma.....	53	1,618	234	62,686	638	19	805	109	17,673	387	72	2,423	343	49,961	1,015	90	3,657	556	82,209	1,763	35
36	Oregon.....	13	833	68	6,879	169	12	571	79	12,619	311	25	924	145	19,498	450	54	3,458	540	80,873	2,198	36
37	Pennsylvania.....	35	1,123	160	10,685	598	11	707	106	11,880	420	46	1,832	266	22,565	1,018	284	34,603	4,430	628,852	24,631	37
38	Rhode Island.....	..	..	..	..	..	2	34	..	40	23	2	34	..	40	23	18	2,390	381	37,281	1,554	38
39	South Carolina...	6	133	14	3,417	69	1	35	..	280	20	7	168	14	8,697	89	39	2,358	239	56,828	1,503	39
40	South Dakota.....	12	255	62	5,119	118	2	81	15	1,911	58	14	336	77	7,060	176	38	1,751	339	40,156	1,038	40
41	Tennessee.....	30	776	67	13,900	332	9	318	52	5,739	122	39	1,094	119	19,639	454	72	4,247	482	91,104	2,637	41
42	Texas.....	128	2,480	428	55,227	1,046	43	1,750	228	44,893	939	171	4,230	636	99,622	2,005	263	10,960	1,531	274,793	5,865	42
43	Utah.....	7	127	36	1,867	56	1	18	6	253	7	8	145	42	2,120	63	22	1,431	330	31,957	800	43
44	Vermont.....	1	14	..	110	5	4	991	32	1,608	831	5	1,005	12	1,718	836	24	2,209	203	27,848	1,635	44
45	Virginia.....	19	711	66	12,572	387	18	1,020	113	25,853	670	37	1,731	179	38,425	1,057	81	3,366	588	124,004	3,365	45
46	Washington.....	22	566	100	10,936	268	8	298	50	5,535	140	30	864	150	16,494	408	77	5,806	937	119,582	3,366	46
47	West Virginia....	16	668	72	18,113	329	21	1,546	140	42,636	959	37	2,214	212	60,769	1,288	63	4,078	500	110,754	2,752	47
48	Wisconsin.....	33	519	150	10,151	250	11	529	36	4,730	333	44	1,048	186	14,881	603	138	9,911	1,572	200,846	6,299	48
49	Wyoming.....	10	176	50	2,554	75	2	50	13	808	15	12	226	63	3,362	90	17	349	85	5,881	142	49
50	Totals (1939)....	1,190	29,879	4,756	501,800	14,935	456	26,496	2,989	456,739	16,154	1,646	56,373	7,745	958,619	31,709	4,486	349,880	49,160	7,144,863	232,435	50
51	(1938).....	1,188	30,193	4,557	495,353	15,255	493	26,556	3,236	470,136	15,630	1,681	56,743	7,793	965,689	30,883	4,438	346,244	47,636	6,813,795	229,019	51
52	(1937).....	1,183	29,937	4,766	508,359	15,458	530	28,083	3,516	507,077	16,477	1,713	58,042	8,282	1,015,436	31,935	4,406	335,799	46,014	6,771,592	225,556	52
53	(1936).....	1,204	28,406	4,356	437,797	13,672	550	28,511	3,629	497,457	16,462	1,754	57,007	7,985	935,254	30,134	4,465	332,881	45,383	6,194,026	211,681	53
54	(1935).....	1,255	29,913	4,384	413,997	14,212	627	34,946	4,357	532,590	18,697	1,882	64,830	8,741	946,587	32,909	4,522	333,427	44,893	5,424,102	200,589	54
55	(1934).....	1,310	29,429	4,301	366,313	12,046	620	33,072	4,035	458,303	15,985	1,939	62,501	8,429	824,616	28,031	4,585	330,213	44,030	4,988,351	185,098	55
56	(1933).....	1,435	33,385	4,902	381,861	13,746	..	..	..	..	..	..	..	..	..	..

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE

Marginal No.	General				Nervous and Mental				Tuberculosis				Maternity				Industrial				Eye, Ear, Nose and Throat				Marginal No.		
	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census			
1	Alabama.....	39	5,499	110,751	4,552	4	326	2,385	1,174	16	472	884	462	7	32	471	47	..	..	..	..	..	..	..	1
2	Arizona.....	20	2,375	11,817	1,483	1	93	1,880	904	8	1,071	2,052	1,001	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas.....	10	3,352	32,377	1,013	2	532	11,553	3,297	28	784	1,082	724	1	21	13	34	1	8	..	..	..	..	..	3
4	California.....	210	22,129	577,724	21,310	35	2,718	111,556	28,584	28	6,027	5,432	4,239	10	500	212	3,866	193	2	275	..	..	..	..	4
5	Colorado.....	69	6,736	621	10,259	6,855	8	5,012	2,650	6,410	14	1,775	1,021	961	2	47	242	32	4	675	..	..	..	..	5
6	Connecticut.....	37	6,301	1,045	10,860	4,500	17	912	3,763	1,093	7	1,607	1,257	1,410	1	9	6	72	3	4	..	..	..	..	6
7	Delaware.....	10	1,928	191	21,657	601	2	7,771	1,206	1,898	3	224	134	180	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia.....	10	6,778	511	10,410	4,896	2	7,650	1,163	1,863	7	691	688	608	..	..	..	..	..	..	..	..	..	..	8
9	Florida.....	76	5,930	631	100,400	3,812	6	6,431	1,791	4,965	1	610	687	556	1	16	11	82	11	2	..	..	..	..	9
10	Georgia.....	63	6,073	707	15,764	1,691	3	8,001	2,439	5,733	3	617	872	529	1	22	17	201	21	..	..	..	..	..	10
11	Idaho.....	39	1,636	911	32,041	1,091	3	1,964	342	1,487	1	132	105	117	1	38	12	71	23	..	..	..	..	..	11
12	Illinois.....	266	27,624	691,000	691,000	18,831	39	45,180	6	15,763	4	3,782	4	3,229	5	205	471	3,567	161	2	188	12	
13	Indiana.....	89	8,193	1,290	18,252	4,180	11	11,107	3,682	13,782	27	3,782	4	1,621	2	34	308	12	..	..	..	..	..	..	13
14	Iowa.....	116	7,111	1,103	10,142	4,579	8	7,349	3,895	11,370	5	803	566	708	1	40	64	201	79	..	..	..	..	..	14
15	Kansas.....	76	6,071	860	12,340	3,853	12	8,990	1,370	6,925	3	640	463	403	4	135	64	201	79	..	..	..	..	..	15
16	Kentucky.....	53	8,697	331	13,131	3,110	6	7,071	2,725	6,700	6	410	2,088	1,056	1	43	19	107	35	..	..	..	..	..	16
17	Louisiana.....	49	5,817	110	16,914	2,619	3	3,912	793	3,837	4	512	533	476	1	14	12	400	10	..	..	..	..	..	17
18	Maine.....	43	7,291	787	130,079	5,476	16	10,507	9,090	10,206	6	1,417	1,458	1,272	..	..	..	..	..	..	..	..	..	..	18
19	Maryland.....	121	27,616	2,621	376,037	15,693	8	31,240	10	10,430	30,431	24	4,033	4,627	3,300	7	400	833	5,904	312	..	..	..	..	19
20	Massachusetts.....	161	21,617	2,373	379,379	16,420	37	19,729	7	6,937	29,438	27	2,935	2	363	28	389	100	..	..	..	..	..	..	20
21	Michigan.....	167	11,120	1,463	217,601	7,776	13	15,616	21	4,017	14,100	15	2,071	6	1,538	3	1,611	118	..	..	..	..	..	..	21
22	Minnesota.....	81	8,166	413	25,700	1,722	6	5,589	3,151	5,100	4	520	497	318	..	..	..	..	..	..	..	..	..	..	22
23	Missouri.....	94	11,097	1,211	221,217	1,574	18	16,393	7	4,015	15,121	6	1,918	1,862	1,671	8	497	276	3,765	239	..	..	..	..	23
24	Montana.....	43	3,699	478	55,061	1,872	12	1,998	13	4,222	1,993	1	918	111	211	1	29	153	70	..	..	..	..	..	24
25	Nebraska.....	87	4,601	659	89,042	2,703	5	5,723	889	5,471	1	101	186	154	1	226	29	153	70	..	..	..	..	..	25
26	Nevada.....	15	602	87	10,321	431	1	375	77	316	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27	New Hampshire.....	15	2,225	374	42,019	1,470	2	2,891	713	2,793	2	246	181	184	1	22	19	202	10	..	..	..	..	..	27
28	New Jersey.....	90	13,223	1,938	292,306	8,811	23	21,464	3	5,930	29,317	17	3,358	1	720	338	306	6,500	226	..	..	..	..	..	28
29	New Mexico.....	41	2,216	223	20,882	1,218	3	976	29,374	3,835	6	669	1	731	3	480	..	..	..	..	..	..	..	..	29
30	New York.....	328	68,937	7,556	1,183,032	46,320	65	101,377	2	29,201	95,888	60	11,622	12	10,015	16	711	517	12,033	424	30	
31	North Carolina.....	121	7,317	1,190	188,063	4,818	9	7,497	4	631	2,776	20	2,020	3,230	2,293	1	40	4	35	1	31	
32	Ohio.....	135	10,615	1,458	437,055	13,968	28	28,917	1	7,396	27,529	21	3,368	3,533	3,069	2	71	8	124	31	32	
33	Oklahoma.....	105	5,766	683	112,210	3,439	8	6,749	3,057	3,893	5	678	1,698	873	9	307	3,556	293	33	
34	Oregon.....	64	4,169	302	63,182	2,998	4	4,770	1,871	5,081	4	694	626	584	3	167	31	301	103	34	
35	Pennsylvania.....	224	34,522	4,114	934,068	21,115	46	43,063	4	10,324	43,254	16	4,066	3,495	3,644	11	507	190	5,677	374	35	
36	Rhode Island.....	13	3,425	217	36,224	2,021	4	3,904	1	938	3,672	2	655	36	
37	South Carolina.....	45	3,491	373	87,521	2,793	3	5,260	1	1,941	5,139	5	740	37	
38	Tennessee.....	62	6,150	688	133,977	1,919	2	7,589	..	373	2,207	2	301	38	
39	Texas.....	270	14,013	1,810	319,026	8,022	18	18,072	2	6,673	17,078	13	2,018	1	2,931	3	66	43	623	45	39	
40	Vermont.....	29	1,910	381	40,511	1,183	4	1,676	..	435	1,466	1	104	40	
41	Virginia.....	81	7,813	731	131,120	5,035	8	1,481	..	832	2,104	3	208	41	
42	Washington.....	8	7,192	1,621	160,017	4,852	0	9,072	..	6,489	11,689	10	1,281	42	
43	West Virginia.....	61	5,282	1,021	121,910	2,070	7	4,000	4	1,301	3,671	8	1,150	43	
44	Wisconsin.....	11	11,190	1,787	250,000	7,160	52	16,800	4	7,034	15,961	22	2,113	1	840	1	20	18	22	14	44	
45	Wyoming.....	35	1,181	165	22,465	704	3	1,908	1	467	1,409	1	31	45	
46	Totals (1925).....	4,224	411,917	55,183	9,018,310	307,761	600	690,284	110	190,219	577,107	480	73,972	38	50,617	65,467	118	5,533	3,190	50,381	3,552	46
47	1913.....	4,286	425,241	62,021	8,415,330	292,870	592	701,822	137	193,703	593,387	493	70,022	35	104,801	60,242	120	5,009	3,361	56,145	3,099	47
48	1907.....	4,215	412,601	51,068	8,140,773	288,																					

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE—Continued

Marginal No.	Children's					Orthopedic					Isolation					Convalescent and Rest					Hospital Departments of Institutions					All Other Hospitals					Totals					Marginal No.
	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census	Hospitals	Beds	Basinsets	Patients Admitted	Average Census						
1	Alabama.....	1	60	1,144	30	1	50	207	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	13,560	514	120,470	11,032	1
2	Arizona.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	8,338	396	45,714	3,500	2
3	Arkansas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	10,120	388	65,140	8,267	3
4	California.....	1	87	917	50	..	133	2,472	120	..	1	16	116	184	376	1,888	376	9,224	3,901	83	..	1	60	4	635	50	..	..	..	..	4	
5	Colorado.....	4	407	10,110	200	2	135	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	99	13,727	630	106,130	10,318	5
6	Connecticut.....	1	200	3,680	126	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	81	19,113	1,062	162,017	10,111	6
7	Delaware.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	2,593	102	21,577	12,883	7
8	District of Columbia.....	1	200	6,001	122	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28	14,087	636	111,811	9,174	8
9	Florida.....	1	42	1,051	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	97	12,312	672	115,067	9,174	9
10	Georgia.....	1	232	3,785	164	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	16,025	719	157,246	13,553	10
11	Idaho.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	3,366	328	37,812	2,640	11
12	Illinois.....	1	232	3,785	164	3	480	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	301	81,105	4,192	681,397	66,607	12
13	Indiana.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	132	25,129	1,290	210,393	21,113	13
14	Iowa.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	151	20,648	1,169	177,575	17,140	14
15	Kansas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120	15,044	838	125,362	11,694	15
16	Kentucky.....	1	75	1,153	48	2	124	775	97	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	95	15,815	634	125,004	13,109	16
17	Louisiana.....	1	100	572	79	1	60	194	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	17,012	856	203,407	13,442	17
18	Maine.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62	7,479	432	58,288	6,447	18
19	Maryland.....	1	100	572	79	2	217	478	165	..	..	110	1218	62	4	200	407	230	3	121	..	..	..	..	..	80	20,352	792	143,254	17,491	19
20	Massachusetts.....	9	583	7,917	404	4	510	600	449	..	..	8	400	4	1,120	135	1,303	523	10	611	..	..	..	..	..	240	61,401	2,698	425,082	51,921	20
21	Michigan.....	2	263	7,791	216	1	50	127	37	..	..	6	327	..	2,626	165	3	270	915	160	8	1,611	..	..	..	233	51,692	2,410	410,046	43,694	21
22	Minnesota.....	1	65	1,624	30	2	310	802	281	..	..	2	44	..	84	5	410	2,052	339	7	331	..	..	..	..	219	30,371	1,684	273,513	25,246	22
23	Mississippi.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	97	9,460	413	80,635	7,206	23
24	Missouri.....	3	420	6,387	315	2	160	604	132	1	200	..	1,283	121	2	65	122	55	6	607	145	31,783	1,644	400,627	25,815	24				
25	Montana.....	1	20	100	14	1	20	100	14	..	..	1	25	..	80	4	..	..	..	..	..	..	..	..	..	59	10,469	685	55,578	4,064	25
26	Nebraska.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	1,068	37	10,398	780	26
27	Nevada.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44	5,623	393	45,261	4,489	27
28	New Hampshire.....	1	60	1,269	37	6	762	4,092	308	..	..	1	67	..	184	10	1	52	9	50	2	120	..	..	..	167	44,894	2,250	337,317	38,103	28
29	New Jersey.....	5	81	105	12,521	630	2	160	412	9	167	44,894	2,250	337,317	38,103	29				
30	New Mexico.....	4	103	12,521	630	14	1,980	12,618	1,511	..	..	6	772	..	4,602	351	28	1,746	11,701	1,473	28	1,043	..	..	..	167	44,894	2,250	337,317	38,103	30
31	New York.....	5	103	12,521	630	14	1,980	12,618	1,511	..	..	6	772	..	4,602	351	28	1,746	11,701	1,473	28	1,043	..	..	..	167	44,894	2,250	337,317	38,103	31
32	North Carolina.....	4	475	8,154	306	3	135	213	100	..	..	2	88	..	261	8	5	531	2	897	458	20	1,027	..	..	53	6,219	427	56,622	4,623	32	
33	North Dakota.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	6,219	427	56,622	4,623	33
34	Oklahoma.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	6,219	427	56,622	4,623	34
35	Oregon.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	126	15,942	713	122,311	13,057	35
36	Pennsylvania.....	5	450	8,213	307	9	786	1,380	618	..	..	1	100	..	3,361	18	1	25	151	13	3	72	..	..	..	72	10,932	506	97,009	9,303	36
37	Rhode Island.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	120	15,942	713	122,311	13,057	37
38	South Carolina.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	354	89,071	4,684	731,594	74,233	38
39	South Dakota.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	8,322	402	43,542	6,702	39
40	Tennessee.....	1	73	11	1,362	44	6	244	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	57	5,447	407	51,528	4,011	40
41	Texas.....	2	95	1,277	53	3	131	1,377	92	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	96	15,717	704	148,847	13,230	41
42	Utah.....	1	25	97	18	1	20	60	20	329	36,851	1,885	383,270	28,033	42					
43	Vermont.....	31	4,056	203	30,945	3,368	43					

HOSPITAL SERVICE

JOUR. A. M. A.
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BIRTHS IN REGISTERED HOSPITALS

The year 1938 marked the first time in history that the number of births in hospitals registered by the American Medical Association had passed the one million mark. The total was then 1,026,771. In 1939 there was a further increase to 1,099,713 hospital births within the continental limits of the United States. This represents nearly 50 per cent of all births in this country, since the latest available statistics (1937) indicate a total of 2,203,337 live babies born.

From the accompanying compilation of statistics for 1929, 1938 and 1939 it can be noted that the number of hospital births has practically doubled during the last ten years, the increase being more pronounced in the governmental group, which reported 83,541 births in 1929 and 195,552 in 1939. This is an increase of 134

Births in Registered Hospitals

	1929	1938	1939
According to Ownership or Control:			
Federal.....	2,206	7,827	8,596
State.....	9,125	22,784	25,724
County.....	17,527	49,635	55,709
City.....	45,787	86,767	91,444
City-county.....	8,806	11,521	14,079
Total governmental.....	83,541	178,534	195,552
Church.....	.....	.....	.....
Fraternal.....	200,726	336,066	300,293
Nonprofit corporations and associations.....	1,730	1,683	1,759
Industrial.....	.....	403,298	432,684
Independent associations.....	4,327	.....	.....
Total nonprofit.....	253,136	741,387	794,736
Individual and partnership.....	.....	54,107	61,069
Corporations (profit unrestricted).....	39,436	32,543	48,350
Total proprietary.....	.....	106,650	109,425
Total nongovernmental.....	538,355	848,237	904,161
According to Type of Service:			
General.....	566,177	976,970	1,051,286
Maternity.....	53,019	47,381	45,664
Children's.....	862	1,817	2,300
Hospital departments of institutions.....	277	211	128
All other hospitals.....	1,561	352	326
Total births in all hospitals.....	621,896	1,026,771	1,099,713

per cent as compared to an increase of 68 per cent in the nongovernmental group, which advanced from 538,355 births to 904,161.

The general hospitals continue to show a gain in obstetric service, for in 1939 they reported 95.6 per cent of the total births whereas in 1938 the ratio was 95.1 per cent and, in 1929, 91 per cent. During the same period the maternity hospitals have shown a continual decrease in the number and percentage of hospital births. In 1929, when 146 maternity hospitals reported 53,019 live babies born, the ratio to total births was 8.5 per cent. By 1938 the hospitals had decreased to 120 and births to 47,381, or 4.6 per cent. In 1939 the maternity hospitals totaled 118 and births 45,664, a ratio of 4.2 per cent in relation to all hospital births.

It should also be noted that the hospitals approved for intern and residency training reported 579,072 births in 1939 whereas all other registered hospitals had 520,641. This is particularly of interest from the standpoint of clinical material available for teaching purposes. Bassinets totaled 47,939 in 1929, 56,747 in 1938 and 58,764 in 1939. The corresponding ratios of births to bassinets was 13, 18 and 19 per cent.

REGISTRATION—MEANING AND METHOD

The earliest available list of hospitals in the United States is probably that prepared by J. M. Toner, M.D., under the auspices of the United States Bureau of Education and published in the Transactions of the American Medical Association, volume 24, 1873. It covered twenty-five pages of the Proceedings and contained the names of 178 hospitals having a total capacity of 35,604 beds, to which 146,472 patients were admitted during the year 1872.

The 178 hospitals reported 309 resident medical officers in addition to 580 members of attending medical and surgical staffs. Forty medical students were employed.

The greatest number of hospitals reported for any one state was fifty-three in New York, followed by twenty-two in Pennsylvania, seventeen in Illinois and thirteen in Massachusetts. Eighteen hospitals had a capacity of 400 beds; there were thirty-eight hospitals having between 200 and 400, forty-six between 100 and 200 and fourteen between forty and 100; twenty-two had a capacity of fifty beds or less. Nine hospitals reported that they were connected with medical schools, and thirty-six others stated that they were used for clinical instruction. Thirty of the 178 hospitals were supported by states, fifteen by cities, four by counties, seven by religious denominations and sixty-seven by "patients and other sources."

However, that list was incomplete, for there are in the files of the American Medical Association records of many hospitals that were established prior to 1872 which were not included.

There seems to have been no important attempt to provide a list of hospitals during the ensuing thirty years, or until 1903, when the Standard Medical Directory, published by G. P. Engelhard and Company, forerunner of the American Medical Directory, contained the names of a considerable number of hospitals. It also included many orphanages, homes and dispensaries, Neal institutes and Keeley institutes. Data about most institutions were incomplete, consisting not infrequently of only the name and address. Sometimes the type of service was mentioned and whether the institution was "private" or "public." There was apparently no discrimination as to character or reputation of institutions. The list appears to have been prepared to accommodate dealers and manufacturers of furnishings and supplies. Only one edition of the Standard Directory was ever issued.

In 1904 the American Medical Association took over the records of the Standard Directory and compiled a list of hospitals for the first edition of the American Medical Directory, published in 1906. Care was taken to include only reputable medical institutions and to exclude those that were known to harbor quacks or to be in other respects unreliable. In quality, therefore, it was a great improvement over the Standard Directory, but it still failed to achieve the desired completeness.

By 1909, however, when the second edition of the American Medical Directory was published, the Association had secured reliable information about very nearly all of the hospitals deserving to be classified as such. The 1909 list was still further purged by the elimination of questionable enterprises, "patent medicine" concerns and other institutions of a fraudulent or irregular nature. In each successive issue of the American Medical Directory down to the present there has been included an increasingly

accurate and complete list of hospitals, giving uniform information about each.

In 1920 the Association vastly expanded the usefulness of the list of hospitals by publishing in THE JOURNAL for April 16, 1921, the names and essential data about all the accepted hospitals except those caring for mental and contagious diseases. For each institution was given the name and location, the population of the city or town, the county in which located, the number

Hospitals, Sanatoriums and Related Institutions

	Hospitals	Beds	Bassinets	Births	Patients Admitted	Average Census
Registered hospitals and sanatoriums approved for internships, residencies and fellowships	1,022	434,777	26,470	579,072	5,300,499	363,184
Other registered hospitals, sanatoriums and related institutions...	5,204	760,249	32,294	520,641	4,578,745	633,299
Total registered hospitals	6,226	1,195,026	58,764	1,099,713	9,879,244	996,483

of beds and the average census. Encouraged by the reception given this first list, THE JOURNAL has continued to publish annually a register of hospitals, which has become accepted as the most complete and authentic list available.

Since 1920, therefore, the Council on Medical Education and Hospitals has conducted an Annual Census of Hospitals which, as the result of almost 100 per cent response by hospitals, has yielded the remarkably complete and accurate statistics in each Hospital Number. Outline maps for each state showing the location of each hospital, designating classification with appropriate symbols, were included in the 1926 Hospital Number, and in 1928 the list of hospitals was first given the name of the American Medical Association's Register of Hospitals. Institutions accepted for publication have since been known as "Registered Hospitals." The Register, therefore, is an outgrowth or development or evolution of the censored list of hospitals in the American Medical Directory. The data on file in the Council's office cover all the hospitals known to be in existence and include correspondence with the hospitals themselves, reports issued by them, correspondence with physicians familiar with the hospitals and biographic data about each of the physicians serving as a staff member or in any other capacity. There are also many data about borderline institutions frequently loosely referred to as hospitals. It is possible, therefore, to make a rather drastic elimination of custodial institutions and to present a list of hospitals.

Beginning in 1913, inspections have been made in hundreds of hospitals through cooperation with hospital committees in the various states and cities, officially appointed by the state medical society. Inspections were frequently made by deans or other officials of medical colleges. A staff of hospital examiners has been maintained by the Council since 1927.

The 1929 Register of Hospitals contained the Essentials of a Registered Hospital, which had been prepared by the Council on Medical Education and Hospitals and ratified by the House of Delegates. The list of registered hospitals grows progressively better from year to year. That there are still some institutions on the Register that do not deserve the recognition is quite probable. That the process of elimination of the

unfit and elevating of the ideals of practices and services in all hospitals will be still further speeded up, there can be no doubt. The public is being gradually educated to know what is proper hospital service and medical care. The public is also continuing to demand better service. It is obvious, therefore, that advancing standards will compel hospitals now on the borderline to move up or close up. It is obvious that better and better service will be demanded by the public. Those hospitals on the margin will have to make unusually strenuous efforts. In fact, the time is now here when such service as outlined in the Essentials of a Registered Hospital is expected of all institutions and agencies that hold themselves out to provide hospital care.

REGISTRATION AND APPROVAL

Registration of hospitals does not mean the same as approval. The Essentials of a Registered Hospital set principles and hold out ideals. In all fairness to the hospitals, they have been employed in such a way as to raise the standards of hospitals and to point the way to better service in the interest of the patient. The function served by the Essentials has been, to a very great extent, educational. Hundreds of hospitals have expressed their appreciation of the principles set forth in the Essentials and the help that was given them. Especially have registered hospitals appreciated the moral restraint that has been exerted against those institutions which would not, or could not, conform to the ethical and professional requirements of the Association.

"Approval" means specific endorsement of hospitals for educational purposes, fitness for which is determined by inspection, close observation and long acquaintance with the ideals of the institution. Thus the Council maintains a list of hospitals that are approved for the training of interns, the first issue of which appeared in 1914. The list has been kept up with increasing exactness and integrity, being subject to inspection by hospital examiners sent out from the Council's office since 1927. The list of hospitals approved for resi-

Hospitals in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands

	Hospitals	Beds	Bassinets
Alaska.....	20	591	74
Canal Zone.....	9	1,631	40
Guam.....	1	156	10
Hawaii.....	48	5,686	256
.....	115	10,807	703
.....	60	6,249	271
.....	5	363	31
Totals (1939).....	258	25,488	1,415
(1938).....	259	24,232	1,457
(1937).....	243	22,464	1,382
(1936).....	230	20,719	1,289
(1935).....	233	19,416	1,150
(1934).....	221	18,430	1,020

dencies in specialties was begun around 1923, was first published in 1926, and has likewise been constantly revised and improved.

The hospitals and their staffs have been most cooperative in improving their educational facilities, and the Council acknowledges the loyalty of the hospital staffs and officials as well as of the medical schools and of the interns and residents themselves.

Publicity has been given to the approved hospitals by the wide circulation of reprints as well as publication in the Educational and Hospital numbers of THE JOURNAL and in the Directory. In all the lists of hospitals published by the Association the hospitals approved for intern training are designated by a star,

and those approved for residencies in specialties are indicated by a plus sign.

APPROVAL BY THE AMERICAN COLLEGE OF SURGEONS

In the present issue the list of registered hospitals carries a special designation of the delta (Δ) indicating the hospitals that have been approved as unconditionally meeting the minimum standards of the American College of Surgeons. The College, founded in 1913, began the development of its list of approved hospitals in 1918, and at the present time there are 2,354 hospitals unconditionally approved in the United States. The total capacity of these hospitals is 549,695 beds and 36,805 bassinets and they admitted 7,066,593 patients. The College has maintained since that time a corps of experienced hospital examiners and has given much publicity and much counsel and advice of an educational nature through its *Bulletin* and other periodicals. Frequent regional and national conferences are held by the College. The principles underlying the requirements of the College are well understood and the designation of the hospitals as approved in this issue of *THE JOURNAL* will serve to discriminate still further between hospitals on the basis of completeness of facilities and quality of service.

OUTPATIENT DEPARTMENTS

Statistics on outpatient departments have been found of very limited value without more exact definition and classification. Restricting the term "outpatient departments" to ambulatory services connected with hospitals, analysis quickly shows that there is quite a variety of types. Among these types are the following:

First, there is the organized, departmentalized type, in which there are specialized services corresponding to the specialty sections of the medical staff, such as medicine, surgery and pediatrics. We are able positively to identify 458 of this type, 425 being in hospitals

approved for internships or residencies, and thirty-three in other registered hospitals.

Next is the organized but undeptartmentalized type. These have regularly scheduled hours for ambulatory patients but no regularly scheduled specialty periods or clinics. We find 458 outpatient departments of this type—seventy-four being in hospitals approved for internships or residencies and 384 in other registered hospitals.

Another type of ambulatory service reported as "outpatient departments" by hospitals consists of the private practice of physicians who see some or all of their patients at the hospital. This is typical of proprietary hospitals but is not unusual in others.

Some hospitals report their emergency or first aid rooms as "outpatient departments." Service here may extend to nonemergent ambulatory patients.

Then there are clinics connected with specialized hospitals, such as tuberculosis or mental diseases, and limited to the respective specialty. Furthermore, such clinics may be conducted by the hospital staff at the hospital building or at extramural centers.

Again, some hospitals without outpatient departments conducted by their own staffs make facilities available to staffs of outside agencies for special clinics. This would include tuberculosis, venereal disease and other clinics conducted at the hospital by a public health agency.

Hospitals maintained by the Army, Navy, Veterans Bureau, Department of Indian Affairs, United States Public Health Service and other governmental agencies often have connected outpatient departments or ambulatory services. Some of these outpatient departments might be classified under the various types that have been mentioned, while others might fall under additional types not mentioned.

INTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

Of 6,226 hospitals now registered by the American Medical Association, 736 have assumed an educational function in accordance with the standards set forth in the Essentials in a Hospital Approved for Training Interns. From recent reports it is apparent that these institutions employ annually about 7,654 interns, 548 general resident physicians, 230 dental interns and 415 medical students as externs. General residents are employed in 261 hospitals, dental interns in 144 and medical students in 143. In addition there are many hospitals that participate in undergraduate instruction in affiliation with the medical schools.

The total number of internships now available is approximately 7,998, including 4,956 in private hospitals and 3,042 in institutions under public control. When the first list of the Council was published in 1914 there were 2,667 positions available exclusive of 428 internships in specialty hospitals. By 1923 this number had increased to 3,119, in 1930 it had reached 5,531 and in 1937 the total was 7,167. From these reports it would appear that internships have now reached a saturation point in relation to the number of medical graduates, approximately 5,200 a year.

NUMBER OF VACANCIES

It is not reasonable to assume that an exact balance will always be maintained between the number of internships and the annual number of medical graduates. Variations are bound to occur not only in the enrolment of medical schools but also in the number of hospitals

that wish to participate in the training of interns. As a matter of fact, an excess of approved internships is desirable in order that all students may obtain acceptable training during their fifth year of medicine.

In the early years of the institutional apprenticeships only a few of the graduates were fortunate enough to secure a hospital appointment. Gradually the internship became recognized as an essential part of medical education and the hospitals themselves found an increasing need for the services of house officers. Not until 1923 did the number of internships equal the number of medical graduates but thereafter a satisfactory balance was maintained for several years. Since 1930 there has been an excess of internships in relation to the annual output of the American medical colleges. In 1938, for example, the graduates totaled 5,194, the internships 7,373, yet only 6,100 positions were available during the year, since many of the services were of longer duration than twelve months. While these figures would indicate approximately 900 vacancies, it must be taken into consideration that many positions are held by second year interns, foreign graduates and applicants from Canadian medical schools.

Reports received from the approved hospitals in January 1939 throw additional light on this problem. At that time there were 7,765 internships available in the United States and 7,448 interns employed, indicating a total of 317 vacancies. As a further check the following questions were incorporated in the annual census blanks forwarded to all intern hospitals at the

end of 1939: "Are there any vacancies on your intern staff at present? If so, how many?" All hospitals replied and 176 reported a total of 344 vacancies, sixty

TABLE A.—Number of Vacancies in Approved Intern Hospitals
Dec. 31, 1939

State	Public Hospitals		Private Hospitals	
	Number of Hospitals	Number of Vacancies	Number of Hospitals	Number of Vacancies
Alabama.....	1	1	1	1
California.....	2	3	5	5
Colorado.....	..	..	3	4
Connecticut.....	..	..	2	2
District of Columbia..	1	1	..	..
Florida.....	..	1	3	5
Georgia.....	1	1	3	5
Illinois.....	2	3	24	57
Indiana.....	1	2	4	9
Iowa.....	..	..	7	16
Kansas.....	..	..	2	4
Kentucky.....	..	..	3	1
Louisiana.....	1	3	1	1
Maine.....	..	..	3	5
Maryland.....	1	1	3	5
Massachusetts.....	..	..	5	7
Michigan.....	2	9	9	14
Minnesota.....	..	..	4	8
Missouri.....	2	23	2	2
Montana.....	..	..	1	1
Nebraska.....	1	1	3	4
New Jersey.....	..	..	10	19
New York.....	4	8	11	18
North Carolina.....	..	..	1	1
North Dakota.....	..	..	2	2
Ohio.....	..	..	9	19
Pennsylvania.....	..	..	14	24
Rhode Island.....	..	..	2	4
South Carolina.....	1	3	..	..
Tennessee.....	..	..	1	1
Texas.....	..	..	4	7
Utah.....	..	..	2	2
Washington.....	1	2	2	3
West Virginia.....	..	..	1	1
Wisconsin.....	..	..	12	19
Totals.....	21	60	155	284

TABLE B.—Classification of Residencies and Fellowships

Specialty	1927	1934	1937	March 1940			Total
				Residencies	Assistant Residencies	Fellowships	
	19	6	40	72	20	11	103
	1	2	4	4	..	2	6
	26	34	43	40	3	..	49
	27	22	34	26	17	13	56
Endocrinology	..	7	2	1	..	..	1
	1	2	3	4	2	..	6
	..	32	34	21	19	2	42
	7	34	34	37	18	10	63
	220	326	437	276	270	164	710
	..	6	2	4	..	..	4
	45	23	10	58	11	..	61
	2	38	54	37	13	16	66
	..	9	25	16	7	3	26
	..	79	91	74	30	1	105
	111	129	197	138	103	28	269
Ophthalmology.....	75	83	125	93	32	18	145
Ophthalmology-Otolaryngology....	..	88	75	65	41	5	111
Orthopedic Surgery.....	37	85	122	106	56	29	191
Otolaryngology.....	64	88	141	99	40	12	151
	93	110	167	167	57	23	252
	145	253	301	164	182	18	364
	2	..	2	2	..	3	5
	..	..	2	4	..	3	7
	362	230	279	320	56	28	404
	49	66	110	139	53	53	245
Surgery.....	262	404	550	324	390	123	842
	..	4	6	12	7	..	19
	..	..	..	2	1	..	3
Tuberculosis.....	159	143	192	215	33	17	270
Urology.....	34	58	88	61	41	21	123
Other.....	35	10	2	..	..	..	..
Totals.....	1,776	2,373	3,202	2,589	1,507	613	4,709

in public hospitals and 284 in institutions under private control. Reference should be made to table A. From these figures it would appear that the demand for interns does not greatly exceed the supply of available candidates.

RESIDENCIES AND FELLOWSHIPS

Residencies and fellowships in the clinical branches of medicine and surgery, pathology and radiology represent advanced training usually in preparation for the practice of a specialty. Residencies in specialties, as defined by the Council, are straight services of one or more years following an approved internship. A fellowship is a form of apprenticeship which usually offers greater opportunity for the study of basic sciences and research. Ordinarily a fellowship is a university rather than a hospital appointment. Mixed residencies are general hospital assignments following internship.

TABLE C.—Classification of Deaths and Necropsies (1938)

States	Stillbirths		Coroner's Cases		Other Deaths		Coroner's Necropsies*	Necropsy Percentage
	Number	Necropsies	Deaths	Necropsies	Number	Necropsies		
Alabama.....	126	62	187	45	1,315	354	45	29.3
Arizona.....	12	..	70	45	359	155	..	43.1
Arkansas.....	31	1	60	..	436	112	..	25.6
California.....	569	235	2,335	1,352	12,321	5,705	180	47.0
Colorado.....	120	31	239	219	2,091	843	202	45.5
Connecticut.....	343	54	632	213	4,560	1,675	152	38.7
Delaware.....	44	7	58	7	563	169	1	30.1
Dist. of Columbia..	278	78	399	296	3,139	1,289	35	41.7
Florida.....	157	12	268	140	1,700	513	..	30.1
Georgia.....	239	102	40	10	2,666	858	10	32.0
Illinois.....	1,041	529	1,014	309	9,545	3,720	138	40.9
Indiana.....	315	82	440	224	4,238	1,393	74	34.0
Iowa.....	144	23	158	72	2,138	822	126	41.8
Kansas.....	74	31	71	61	1,162	587	60	52.9
Kentucky.....	152	21	472	31	2,479	611	31	23.6
Louisiana.....	490	246	1,127	163	4,884	1,766	188	38.5
Maine.....	52	5	5	11	779	228	2	29.4
Maryland.....	225	76	890	232	4,423	1,846	230	44.6
Massachusetts.....	617	115	1,561	417	9,077	3,129	149	35.6
Michigan.....	640	126	1,659	781	7,443	2,562	433	38.0
Minnesota.....	347	215	145	187	4,123	2,083	118	52.0
Missouri.....	432	104	988	518	6,537	2,992	337	47.1
Montana.....	31	3	14	5	220	74	5	33.1
Nebraska.....	94	33	16	9	1,274	494	9	39.2
New Hampshire....	12	7	8	3	203	126	23	65.9
New Jersey.....	933	188	1,873	763	10,198	2,460	424	27.1
New York.....	3,282	1,333	4,676	2,030	37,283	11,985	821	33.6
North Carolina.....	208	44	39	16	1,938	610	59	33.5
North Dakota.....	23	8	11	6	232	141	3	61.2
Ohio.....	1,015	275	1,010	308	12,589	4,580	139	37.0
Oklahoma.....	117	10	27	14	1,443	493	10	29.1
Oregon.....	86	44	62	8	1,715	772	8	45.3
Pennsylvania.....	1,732	332	3,811	1,081	18,973	7,609	763	42.4
Rhode Island.....	71	6	278	149	1,350	421	3	31.3
South Carolina.....	148	5	65	50	1,269	345	36	28.7
Tennessee.....	359	25	1	1	4,287	1,176	1	27.4
Texas.....	453	52	181	91	5,721	1,705	124	31.2
Utah.....	95	11	83	12	1,097	276	12	25.9
Vermont.....	21	..	5	5	220	75	5	33.5
Virginia.....	170	18	241	99	1,698	631	110	40.9
Washington.....	145	33	197	105	3,910	1,139	123	31.2
West Virginia.....	84	13	127	1	1,009	293	1	29.4
Wisconsin.....	300	196	160	33	4,729	1,822	142	40.3
Canal Zone.....	82	31	59	59	515	174	59	40.5
Hawaii.....	369	20	280	290	1,728	1,200	..	69.4
Puerto Rico.....	16	3	3	3	102	39	3	40.0
Totals.....	16,236	4,838	25,895	10,434	199,701	71,883	5,394	37.6

* Coroner's necropsies performed by hospital pathologist.

They include services classified as general residencies and chief residencies.

Within the last year new standards of graduate training have been formulated by the Council in cooperation with the specialty boards. These contain the general regulations applicable to all types of residencies and also the specific requirements pertaining to individual specialties. Reference should be made to the Essentials of Approved Residencies and Fellowships published in the Educational Number of THE JOURNAL, Aug. 26, 1939, pages 794-799.

Residencies now constitute the principal avenue of continuation training for medical graduates who desire additional hospital experience after the period of internship. The growth of educational opportunities in the specialty fields has been extraordinary in recent

years as a result of the establishment of the certifying boards and the subsequent emphasis on specialization. Until 1927 residencies were classified as special internships. Thereafter a separate residency classification

residencies in other specialties: anesthesiology seven, cardiology two, communicable diseases five, dermatology and syphilology eight, fractures eight, gynecology five, malignant diseases six, medicine fourteen, neurology one, neurosurgery one, obstetrics nine, obstetrics-gynecology two, ophthalmology seven, otolaryngology seven, ophthalmology-otolaryngology four, orthopedic surgery five, pathology fifteen, pediatrics sixteen, physical therapy two, psychiatry nine, radiology nine, surgery twenty-nine, thoracic surgery four, tuberculosis four, urology twelve.

COOPERATION OF SPECIALTY BOARDS
Within the last two years the Council on Medical Education and Hospitals has entered into cooperation with ten of the certifying boards and the American College of Physicians for the joint study and appraisal

TABLE D.—Classification of Deaths and Necropsies (1939)

States	Stillbirths		Coroner's Cases		Other Deaths		Coroner's Necropsies*	Necropsy Percentage
	Number	Necropsies	Deaths	Necropsies	Number	Necropsies		
Alabama.....	160	56	320	31	1,383	490	31	32.6
Arizona.....	23	2	12	2	456	140	2	31.0
Arkansas.....	32	3	54	..	451	188	..	41.6
California.....	565	179	2,409	1,363	12,328	5,668	269	47.1
Colorado.....	122	40	924	265	1,651	869	254	53.3
Connecticut.....	341	64	431	133	4,790	1,879	119	40.7
Delaware.....	69	21	152	29	606	185	21	32.8
Dist. of Columbia.....	361	155	240	210	2,570	1,038	28	40.8
Florida.....	81	8	174	106	1,424	490	1	34.4
Georgia.....	360	27	35	17	3,022	873	34	29.6
Illinois.....	1,101	647	2,161	1,121	16,642	5,129	263	31.9
Indiana.....	32	48	403	215	3,788	1,397	63	37.9
Iowa.....	176	59	143	61	2,171	815	59	39.1
Kansas.....	78	30	74	42	1,252	648	29	52.8
Kentucky.....	168	15	378	97	2,120	640	97	33.2
Louisiana.....	519	221	1,381	264	5,816	2,080	249	38.4
Maine.....	30	9	12	12	666	195	9	30.2
Maryland.....	284	116	1,209	360	3,944	1,684	117	44.3
Massachusetts.....	647	104	1,754	491	9,526	3,372	232	36.9
Michigan.....	617	140	1,806	292	8,499	3,202	270	39.5
Minnesota.....	316	229	351	212	3,333	2,102	112	54.7
Missouri.....	555	103	1,178	385	9,093	3,082	320	47.1
Montana.....	18	41	10	6	354	75	6	22.5
Nebraska.....	90	33	12	8	1,194	557	9	47.0
New Hampshire.....	13	10	4	1	196	118	1	60.4
New Jersey.....	880	170	1,680	583	10,328	2,491	392	26.9
New York.....	3,228	1,062	5,148	2,158	37,366	12,323	971	34.6
North Carolina.....	158	47	34	20	1,391	461	20	34.1
North Dakota.....	17	11	5	5	245	144	9	60.2
Ohio.....	1,090	221	1,045	307	13,133	4,769	218	37.3
Oklahoma.....	109	18	71	31	1,145	306	31	28.6
Oregon.....	68	33	39	25	1,401	762	23	55.1
Pennsylvania.....	1,587	357	3,767	1,239	18,768	7,402	1,336	43.3
Rhode Island.....	81	9	214	60	1,151	381	30	34.8
South Carolina.....	116	8	92	65	1,229	281	20	24.2
Tennessee.....	352	22	9	5	4,160	1,301	1	31.2
Texas.....	408	72	89	80	4,567	1,448	79	32.8
Utah.....	120	16	1	1	1,070	258	..	23.0
Vermont.....	22	2	..	..	277	108	..	38.9
Virginia.....	174	14	185	69	1,836	601	85	35.7
Washington.....	147	36	205	100	3,580	1,319	33	37.4
West Virginia.....	119	26	76	41	1,194	315	..	26.3
Wisconsin.....	286	65	172	64	4,823	1,819	50	38.3
Puerto Rico.....	16	3	..	..	97	24	..	24.7
Totals.....	16,006	4,532	28,459	10,576	203,646	73,369	5,893	37.8

TABLE F.—Approved Internship Hospitals with Highest Necropsy Percentages (Includes All Over 70 per Cent Reported for 1939)

	Control	Necropsy Percentage
1. Lincoln General Hospital, Lincoln, Neb.....	City	66.9
2. Denver General Hospital, Denver.....	CyCo	94.5
3. Research and Educational Hospital, Chicago.....	State	85.1
4. Columbus Hospital, Chicago.....	Church	83.7
5. Trinity Hospital, Minot, N. D.....	Church	82.5
6. Presbyterian Hospital, Philadelphia.....	Church	82.2
7. University of Nebraska Hospital, Omaha.....	State	81.4
8. Colorado General Hospital, Denver.....	State	79.9
9. Evanston Hospital, Evanston, Ill.....	NPAssn	78.6
10. Passavant Memorial Hospital, Chicago.....	NPAssn	78.6
11. Mary Hitchcock Memorial Hosp., Hanover, N. H.....	NPAssn	77.4
12. University of California Hosp., San Francisco.....	State	76.7
13. University of Chicago Clinics, Chicago.....	NPAssn	76.5
14. Kansas City General Hospital, Kansas City, Mo.....	City	76.0
15. United States Naval Hospital, San Diego, Calif.....	Navy	75.6
16. Hospital of the Protestant Episcopal Church, Philadelphia.....	Church	75.6
17. St. Luke's Hospital, Duluth, Minn.....	NPAssn	75.2
18. St. Luke's Hospital, Chicago.....	NPAssn	73.1
19. University Hospitals, Minneapolis.....	State	72.8
20. Aneker Hospital, St. Paul.....	CyCo	72.6
21. St. Luke's Hospital, Kansas City, Mo.....	Church	72.6
22. St. Francis Hospital, Santa Barbara, Calif.....	Church	72.4
23. Santa Barbara General Hospital, Santa Barbara, Calif.....	County	72.1
24. Montefiore Hospital for Chronic Diseases, New York City.....	NPAssn	71.9
25. St. Joseph Hospital, Kansas City, Mo.....	Church	71.7
26. New Haven Hospital, New Haven, Conn.....	NPAssn	71.4
27. Chestnut Hill Hospital, Philadelphia.....	NPAssn	71.2
28. Johns Hopkins Hospital, Baltimore.....	NPAssn	70.9
29. University of Kansas Hosps., Kansas City, Kan.....	State	70.0

of fellowships and residencies in the respective specialties. Briefly the cooperative plan can be outlined as follows:

(a) After preliminary conferences have been held to determine the method of procedure, the first step involves the preparation of a suitable application blank as required for the particular specialty. This blank is supplied in triplicate and the hospital is requested to return two copies to the American Medical Association, one for the Council on Medical Education and Hospitals, the other for the American Board. In the field of internal medicine an additional copy is furnished for the American College of Physicians.

(b) Inspection is made by a member of the Council's staff to confirm and amplify the data already obtained. Representatives of the boards or of the American College of Physicians may accompany the Council's examiner whenever possible. (See method of evaluating residencies as described in THE JOURNAL, March 26, 1938, p. 978.)

(c) An inspection report is prepared with emphasis on objective data that can subsequently be utilized in the evaluation of the educational program.

(d) Copies of the application and inspection report are forwarded to the secretary of the board for further evaluation.

(e) The application is then submitted to the Council with the recommendation of the board.

was established which has now been extended to include fellowships in radiology, pathology and the clinical branches of medicine.

From 1914 to 1927 the residencies increased from 428 to 1,776. The next five years showed little change,

TABLE E.—Necropsy Performance in Approved Intern Hospitals

Percentage	Number of Hospitals					
	1926	1930	1934	1937	1938	1939
70 or over.....	14	19	28	27	27	29
50-69.....	21	56	56	68	100	115
30-49.....	68	164	240	263	327	319
15-29.....	146	354	346	348	260	251
Below 15.....	329	71	33	26	13	7
Hospitals reporting.....	575	664	703	752	727	721

but since 1934 the opportunities for residency training have practically doubled in number. In 1934 there were 2,373 positions available, three years later 3,202, and at the present time 4,709 including 613 fellowships (table B).

In addition there are 201 unapproved residencies in hospitals approved either for intern training or for

This plan was first placed in operation about a year ago in cooperation with the American Board of Radiology, the American Board of Pathology and the American Board of Anesthesiology. It has since been extended to the boards of Pediatrics, Psychiatry and Neurology, Orthopedic Surgery and Dermatology and Syphilology and is now being completed with the American Board of Internal Medicine, the American Board of Urology and the American Board of Obstetrics and Gynecology.

Through this procedure a uniform method of investigation is assured that will eliminate the need of multiple inspections. The Council and the boards will have identical information on which to base their evaluation of the educational program and their final recommendations. Thus it will be possible to maintain lists of approved residencies and fellowships equally acceptable to the Council and to the certifying boards.

NECROPSIES IN APPROVED INTERN HOSPITALS

It has frequently been said that the incidence of necropsy performance in hospitals reflects the scientific attitude of the staff and the quality of educational service. Logically, therefore, the success of an internship will depend largely on the amount of pathologic material available for teaching purposes.

Currently the Council requires a minimum necropsy rate of 15 per cent and at least thirty-six postmortem examinations a year in hospitals approved for training interns. The numerical requirement became effective Jan. 1, 1940, and will henceforth be an important factor in the evaluation and approval of educational

services. Over 99 per cent of the hospitals complied with the percentage requirement last year and 85 per cent (representing 94 per cent of the total internships) had the required number of necropsies.

In 1937 the average necropsy rate in hospitals approved for intern training was 34.4 per cent on the basis of 85,050 necropsies and 247,410 deaths including coroner's cases and stillbirths. The following year, when 241,932 deaths and 87,155 postmortem examinations were reported, the ratio was 36.0 per cent. In 1939, however, it was 35.6 per cent, while necropsies increased to 88,497 and deaths to 248,111.

When stillbirths and coroner's cases not available for teaching are excluded, the average rates become 37.6 per cent for 1938 and 37.8 per cent for 1939. Attention is called to tables C and D, showing the classification of deaths and necropsies during the last two years. It should be noted that percentages have been computed in accordance with the method described in the Hospital Number of *THE JOURNAL*, March 11, 1939, page 925.

In table E is an illustration of necropsy performance at varying intervals between 1926 and 1939. Especially significant is the continuing increase in the number of hospitals that occupy the higher percentage levels. Last year, for example, 319 hospitals had a necropsy rate of 30 to 49 per cent, 115 from 50 to 69 per cent and, as shown in table F, twenty-nine had the highly commendable ratio of 70 per cent or over. This accomplishment should serve as an inspiration to other institutions that have had less success in their necropsy program.

HOSPITAL MEDICAL LIBRARY SUGGESTIONS

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

An adequate library is essential in hospitals that undertake an educational function. To interns and resident physicians it is especially important as a source of immediate reference in the study of diagnostic and therapeutic problems and in the preparation of reports for staff meetings and clinical conferences. Indeed, to all physicians a medical library plays a significant part in the continuation of their education.

"A medical group which works with little or no reference to books and journals suffers serious limitations. Without knowledge of what others have discovered, daily experience cannot be resourcefully interpreted. Avoidable mistakes, waste and duplication of effort are inevitable. Doctors become victims of empiricism and routine; imagination and initiative lack stimulus; enthusiasm and energy decline; minds grow sterile that under the quickening influence of the recorded experience of others might have been fruitful."¹

The following are the minimum needs of a reference library as expressed in the Essentials in a Hospital Approved for Training Interns:

"There must be a working medical library, in charge of a librarian, which should contain a useful selection of late editions of standard text and reference books and current files of not less than ten of the better medical journals. The library should be inside the hospital building and be located where it is readily accessible to the interns and staff members. Collections of choice reference books in pathology and clinical diagnosis and in roentgen ray work should be found respectively in the pathologic and roentgenologic departments."

Similarly in the Essentials of Approved Residencies and Fellowships it is stated that "institutions offering graduate training should maintain or provide ready access to an adequate medical library containing modern texts, the *Quarterly Cumulative Index Medicus* and current journals relating to the fields in which residencies and fellowships are offered."

These standards serve as a guide to the establishment of a working library for the house staff where material will be available for general reference. For special needs it is usually possible to obtain additional material from outside sources.

ORGANIZATION

The usefulness of a medical library depends largely on its accessibility, the scope and quality of reference material, and the ability of the librarian and the staff to stimulate an interest in the review of medical literature. It is especially important that the medical staff should take an active interest in the development and maintenance of a suitable library, its financial support, technical supervision, the selection of books and periodicals, and the establishment of appropriate rules and regulations.

A committee of the staff should be appointed to maintain general supervision. Technical direction, however, can be assigned to a librarian who has had adequate training and experience in this work. In the absence of an experienced librarian a competent person from the record department or administrative personnel could be placed in charge.

The medical library is of sufficient importance in the educational scheme to justify the annual budgeting of

1. Dr. George E. Vincent, speaking on the occasion of the celebration of the fiftieth anniversary of the Boston Medical Library, Jan. 19, 1926.

funds for this purpose. Ordinarily it would require from \$300 to \$500 to establish a satisfactory nucleus of reference material for the house staff. By the gradual addition of books and periodicals from year to year a library would be evolved that could be considered an asset to the institution and the community. The annual expenditure would vary in accordance with the amount of reference material supplied, but usually it would require a minimum of \$150 to \$300 to provide the necessary books and journals.

When funds are not furnished through gifts, endowments or the operating budget, it may be possible to maintain the library by annual contributions from the attending physicians. These funds might then be collected in the form of staff dues.

LOCATION

It would be worth while for those interested in developing a medical library to visit similar departments and study the elements that contribute to their success. Any well organized library, general or medical, would furnish valuable suggestions concerning space and equipment, classification of subjects, indexing, and methods of filing, binding and storage.

The location of the medical library will in a large measure determine its usefulness. If it is readily accessible, comfortable and attractive, it will soon become the center of interest of the house staff. The library is most frequently found in the administrative section of the hospital near the record department or staff room, but other locations will also prove satisfactory if adequate organization and supervision are maintained. The room should be sufficiently large to house books, periodicals, reprints and other material without encroaching on the space needed for comfortable reading and uninterrupted study.

REFERENCE MATERIAL

In establishing a medical library, it is well to purchase only a few reference books on each subject. Only recent volumes should be chosen, with the exception of such standard works as are recognized classics in their respective fields and do not rapidly become obsolete. The literature on therapy and diagnosis, for example, is changing with such rapidity that the use of the most recent publications is recommended. In the field of fundamental sciences, such as anatomy and histology, literature is more stabilized and longer lived. More recent editions of the standard textbooks should be added from time to time, thus keeping the library up to date with regard to new methods of diagnosis and treatment. After a good foundation has been formed, the remainder of the apportioned funds may be expended in purchasing varied reference works that are known to be of particular value. The library should not be allowed to become a depository for antiques, and out of date books should be removed or discarded.

The usefulness and efficiency of the hospital medical library depend not only on a good selection of medical books but also on a well chosen group of periodicals. Limited library funds are often more usefully expended for periodicals than for text and reference books. When ample funds are provided there is no great difficulty experienced in the selection of material.

The hospital library may supplement its service by the use of the library facilities of nearby medical schools, the academy of medicine or the local county medical society. It may also utilize the package library of the American Medical Association. This consists of collec-

tions of reprints and other material on various subjects, prepared for lending to members of the Association and to individual subscribers to publications of the American Medical Association. Information on the loan systems of medical school libraries or society libraries can readily be obtained on inquiry.

SUGGESTED PERIODICALS

The following list is furnished as a guide to the selection of medical periodicals in accordance with the needs of the educational service. In view of the interrelation of the various fields of medicine it is desirable that a wide selection be made to cover both general and special subjects. To accomplish this a minimum of ten periodicals would ordinarily be required.

ANATOMY

American Journal of Anatomy. Wistar Institute, 36th St. and Woodland Ave., Philadelphia. Bi-M. \$7.50 per volume.

ANESTHESIA

Anesthésie et analgésie. Masson & Cie, 120 Boulevard Saint-Germain, Paris, 6^e, France. Q. 100 francs.
British Journal of Anæsthesia. Sherratt & Hughes, 34 Cross St., Manchester, England. Q. \$10.
Current Researches in Anæsthesia and Analgesia. 416 E. Market St., Elmira, N. Y. Bi-M. \$10.
Schmerz Narkose-Anæsthesie. Georg Thieme, Rossplatz 12, Leipzig, C. 1., Germany. Bi-M. 12 R. M.

DENTISTRY

American Journal of Orthodontia and Oral Surgery. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$7.
Annals of Dentistry. Annals of Dentistry, Inc., Mt. Royal and Guilford Aves., Baltimore. Q. \$2.
Journal of the American Dental Association. American Dental Association, 212 E. Superior St., Chicago. M. \$5.
Journal of Dental Research. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. Bi-M. \$5.

DERMATOLOGY AND SYPHILOLOGY

American Journal of Syphilis, Gonorrhea and Venereal Diseases. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. Bi-M. \$7.50.
Archives of Dermatology and Syphilology. American Medical Association, 535 N. Dearborn St., Chicago. M. \$8.
British Journal of Dermatology and Syphilis. H. K. Lewis & Co., Ltd., 136 Gower St., London, W. C. 1. M. 2s.
British Journal of Venereal Diseases. Constable & Co., Ltd., 10 Orange St., Leicester Sq., London, W. C. 2. Q. 20s.
Journal of Investigative Dermatology. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. Bi-M. \$6.

HOSPITAL ADMINISTRATION

Hospital Abstract Service. Physicians Record Co., 161 W. Harrison St., Chicago. M. \$6.
Hospitals, The Journal of the American Hospital Association, 18 E. Division St., Chicago. M. \$2. Non-members, \$3.
Hospital Management, 100 E. Ohio St., Chicago. M. \$2.
Hospital Progress. 1402 S. Grand Blvd., St. Louis. M. \$3.
Modern Hospital. 919 N. Michigan Ave., Chicago. M. \$3.

INDEX AND DIRECTORY

American Medical Directory. American Medical Association, 535 N. Dearborn St., Chicago. Bi-A. \$18. (A register of legally qualified physicians of the United States, Alaska, Canal Zone, Hawaii, Philippines, Puerto Rico, Guam, Samoa and Virgin Islands, Canada, Newfoundland, Yukon and Northwest Territories. Contains a list of hospitals in the same countries.)
Quarterly Cumulative Index Medicus. American Medical Association, 535 N. Dearborn St., Chicago. Q. \$12. (An index and guide to the medical literature of the world.)

INFECTIOUS DISEASES, HYGIENE AND PREVENTIVE MEDICINE

American Journal of Hygiene. 615 N. Wolfe St., Baltimore. Bi-M. \$10.
American Journal of Public Health and the Nation's Health. 50 W. 50th St., New York. M. \$5.
American Journal of Tropical Medicine. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. Bi-M. \$5.
Journal of Immunology. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. M. \$9.
Journal of Industrial Hygiene and Toxicology with Abstract of Literature. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. M. \$6.
Journal of Infectious Diseases. 629 S. Wood St., Chicago. Bi-M. \$5.

MEDICINE

American Heart Journal. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$8.50.
American Journal of the Medical Sciences. Lea & Febiger, 609 S. Washington Sq., Philadelphia. M. \$6.
Annals of Internal Medicine. American College of Physicians, Princeton and Lemon St., Lancaster, Pa. M. \$7.
Annals of the Rheumatic Diseases. H. K. Lewis & Co., Ltd., 135 Gower St., London, W. C. 1. Irreg. 6s. per issue.
Archives of Internal Medicine. American Medical Association, 535 N. Dearborn St., Chicago. M. \$5.
British Heart Journal. British Medical Association House, 19 Tavistock Sq., London, W. C. 1. Q. \$6.
British Medical Journal. British Medical Association House, 19 Tavistock Sq., London, W. C. 1. W. 1s. 3d. per issue.

Canadian Medical Association Journal, 3640 University St., Montreal. M. \$7.35.
Clinical Science Incorporating Heart. Shaw & Sons, Ltd., 7, 8, & 9, Fetter Lane, Fleet St., London, E. C. 4. Irreg. £1 17s. 6d.
Hygeia. 535 N. Dearborn St., Chicago. M. \$2.50.
Industrial Medicine. 540 N. Michigan Ave., Chicago. M. \$5.
International Clinics. J. B. Lippincott Co., 227 E. Washington Sq., Philadelphia. Q. \$12.
Journal of Allergy. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. Bi-M. \$7.50.
Journal of Endocrinology. Oxford University Press, Amen House, Warwick Sq., London, E. C. 4. (American office—114 5th Ave., New York.) Q. \$6.
Journal of the American Medical Association. 535 N. Dearborn St., Chicago. W. \$8.
Journal of Clinical Investigation. 654 Madison Ave., New York. Bi-M. \$10.
Journal of Experimental Medicine. Rockefeller Institute for Medical Research, York Ave. and 66th St., New York. M. \$10.
Lancet. 7 Adam St., Adelphi, London, W. C. 2; Oxford University Press (American Branch), 114 5th Ave., New York. W. £2 10s.
Medical Clinics of North America. W. B. Saunders Co., W. Washington Sq., Philadelphia. Bi-M. Cloth, \$16; paper, \$12.
Medicine, Analytical Reviews of General Medicine, Neurology and Pediatrics. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. Q. \$5.
New England Journal of Medicine. 8 The Fenway, Boston. W. \$6.
Quarterly Journal of Medicine. Dr. A. M. Cooke, Sec., 123 Woodstock Rd., Oxford, England. Q. 35s.
Review of Gastroenterology. 1819 Broadway, New York. Bi-M. \$2.50.

NEUROLOGY AND PSYCHIATRY

American Journal of Psychiatry. American Psychiatric Association, 2 E. 103d St., New York. Bi-M. \$6.
Archives of Neurology and Psychiatry. American Medical Association, 535 N. Dearborn St., Chicago. M. \$8.
Brain. A Journal of Neurology. Macmillan & Co., Ltd., St. Martin's St., London, W. C. 2. (American office—60 5th Ave., New York.) Q. 24s.
Journal of Mental Science. J. & A. Churchill, 104 Gloucester Place, Portman Square, London. W. 1. Bi-M. 6s. per issue.
Journal of Nervous and Mental Disease. Dr. Smith Ely Jelliffe, 64 W. 56th St., New York. M. \$10.
Journal of Neurology and Psychiatry. British Medical Association, Tavistock Square, London, W. C. 1. Q. 25s.
Journal of Neurophysiology. Charles C. Thomas, Publisher, 220 E. Monroe St., Springfield, Ill. Bi-M. \$6.
Psychiatry. Journal of the Biology and the Pathology of Interpersonal Relations. William Alanson White Psychiatric Foundation, Inc., 1835 Broadway, New York. Q. \$6.
Division of Anthropology and Psychology, National Research Council, 2101 Constitution Ave., Washington, D. C. Q. \$5.

NUTRITION

American Journal of Digestive Diseases, 435-455 Lincoln Bank Tower, Fort Wayne, Ind. M. \$6.
Journal of Nutrition. Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia. M. \$10.
Nutrition; Abstracts and Reviews. Imperial Bureau of Animal Nutrition, Reid Library. Rowett Institute, Aberdeen, Scotland. Q. £2 2s.

OBSTETRICS AND GYNECOLOGY

American Journal of Obstetrics and Gynecology. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$10.
Journal of Obstetrics and Gynaecology of the British Empire. Sherratt & Hughes, 34 Cross St., Manchester, England. Bi-M. £2 15s.
Surgery, Gynecology and Obstetrics. (Listed under Surgery.)

OPHTHALMOLOGY

American Journal of Ophthalmology. Ophthalmic Publishing Co., 640 S. Kingshighway, St. Louis. M. \$10.
Archives of Ophthalmology. American Medical Association, 535 N. Dearborn St., Chicago. M. \$8.
British Journal of Ophthalmology. Geo. E. Pulman & Sons, Ltd., 24 Thayer St., Marylebone, London, W. 1. M. 2g.

ORTHOPEDIC SURGERY

Journal of Bone and Joint Surgery. 8 The Fenway, Boston. Q. \$5.

OTORHINOLARYNGOLOGY

Annals of Otolaryngology and Laryngology. Annals Publishing Co., 7200 Wydown Blvd., St. Louis. Q. \$6.
Archives of Otolaryngology. American Medical Association, 535 N. Dearborn St., Chicago. M. \$6.
Journal of Laryngology and Otolaryngology. Headley Brothers, 109 Kingsway, London, W. C. 2. (American agent—G. E. Stechert & Co., 31-37 E. 10th St., New York.) M. 40s.
Laryngoscope. 4574 W. Papin St., St. Louis. M. \$6.

PATHOLOGY AND CLINICAL LABORATORY WORK

American Journal of Clinical Pathology. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. Bi-M. \$6.
American Journal of Pathology. Dr. F. B. Mallory, 818 Harrison Ave., Boston. Bi-M. \$8.
Archives of Pathology. American Medical Association, 535 N. Dearborn St., Chicago. M. \$6.
British Journal of Experimental Pathology. H. K. Lewis & Co., Ltd., 136 Gower St., London, W. C. 1. Bi-M. £2.
Journal of Laboratory and Clinical Medicine. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$8.50.
Journal of Pathology and Bacteriology. Oliver & Boyd, Tweeddale Court, 14 High St., Edinburgh; 98 Great Russell St., London, W. C. 1. Bi-M. 60s.

PEDIATRICS

American Journal of Diseases of Children. American Medical Association, 535 N. Dearborn St., Chicago. M. \$8.
Archives of Disease in Childhood. British Medical Association, Tavistock Square, London, W. C. 1. Q. 25s.
Archives of Pediatrics. E. B. Treat & Co., 45 E. 17th St., New York. M. \$5.

British Journal of Children's Diseases. Adlard & Son, 21 Hart St., Bloomsbury Sq., London, W. C. 1. Q. 25s.
Journal of Pediatrics. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$8.50.

PHARMACOLOGY AND THERAPEUTICS

Journal of Pharmacology and Experimental Therapeutics. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. M. \$15.

PHYSICAL THERAPY

Archives of Physical Therapy with International Abstract. American Congress of Physical Therapy, Suite 712, 30 N. Michigan Ave., Chicago. M. \$5.
British Journal of Physical Medicine. 4, 5 & 6 Bell Yard, Temple Bar, London, W. C. 2. M. 21s.

PHYSIOLOGY AND BIOCHEMISTRY

American Journal of Physiology. American Physiological Society, Managing Editor, Dr. D. R. Hooker, 19 W. Chase St., Baltimore. M. \$30.
Journal of Biological Chemistry. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. M. \$22.50.
Journal of Physiology. Cambridge University Press, Bentley House, 200 Euston Rd., London, N. W. 1. M. 30s. per vol. (About 4 vols. yearly.)
Physiological Reviews. American Physiological Society. Dr. D. R. Hooker, Managing Editor, 19 W. Chase St., Baltimore. Q. \$6.

RADIOLOGY

American Journal of Roentgenology and Radium Therapy. Charles C. Thomas, 220 E. Monroe St., Springfield, Ill. M. \$10.
British Journal of Radiology. British Institute of Radiology, 32 Welbeck St., London, W. 1. M. £2 2s.
Radiology. Radiological Society of North America, 607 Medical Arts Bldg., Syracuse, N. Y. M. \$6.

SURGERY

American Journal of Cancer. Institute of Cancer Research of Columbia University, 654 Madison Ave., New York. M. \$9.
American Journal of Surgery. 49 W. 45th St., New York. M. \$10.
Annals of Surgery. J. B. Lippincott Co., 227-231 S. 6th St., Philadelphia. M. \$10.
Archives of Surgery. American Medical Association, 535 N. Dearborn St., Chicago. M. \$8.
British Journal of Surgery. John Wright & Sons, Ltd., Bristol. (American agents—Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore.) Q. 42s.
Journal of Thoracic Surgery. C. V. Mosby Company, 3523 Pine Blvd., St. Louis. Bi-M. \$7.50.
Southern Surgeon. Southern Surgeon Pub. Co., 701 Hurt Bldg., Atlanta. Bi-M. \$5.
Surgery. C. V. Mosby Co., 3523 Pine Blvd., St. Louis. M. \$10.
Surgery, Gynecology and Obstetrics with International Abstract of Surgery. Surgical Publishing Co., 54 E. Erie St., Chicago. M. \$12.
Surgical Clinics of North America. W. B. Saunders Co., W. Washington Sq., Philadelphia. Bi-M. Cloth, \$16; paper, \$12.

TUBERCULOSIS

American Review of Tuberculosis. National Tuberculosis Association, 50 W. 50th St., New York. M. \$8.
British Journal of Tuberculosis. Baillière, Tindall & Cox, 8 Henrietta St., Covent Garden, London, W. C. 2. (American agent—G. E. Stechert & Co., 31-37 E. 10th St., New York.) Q. \$3.50.

UROLOGY

Journal of Urology. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore. M. \$10.
Review of Urologic Surgery in "Archives of Surgery." (See Surgery.)

SUGGESTED BOOKS

The accompanying list is not intended to be complete, but it contains the suggestions of physicians prominent in their respective fields. The books are classified under one heading but may also be of interest in other fields. Therefore it would be advisable to review the entire list. The complete names and addresses of the publishers appear at the end of the list of books. With few exceptions no books published previously to 1930 have been included.

ANATOMY

Arey, Leslie B.: Developmental Anatomy. Ed. 3. \$6.50. Saunders, 1934.
Bremer, J. Lewis: Text-Book of Histology. Fifth edition of "Lewis and Stohr." \$6.50. Blakiston, 1936.
Callander, C. Latimer: Surgical Anatomy. Ed. 2. \$10. Saunders, 1939.
Cowdry, E. V. (ed.): Special Cytology. Form and Functions of the Cell in Health and Disease. In 3 volumes. Ed. 2. \$30. Hoeber, 1932.
Cunningham, Daniel J.: Text-Book of Anatomy. Ed. 7, ed. by J. C. Brash and E. B. Jamieson. \$10. Oxford, 1937.
Davis, Gwilym G.: Applied Anatomy. Ed. 9. \$9. Lippincott, 1934.
Gray, Henry: Anatomy of the Human Body. Ed. 23, rev. and re-ed. by Warren H. Lewis. \$10. Lea, 1936.
Massie, Grant: Surgical Anatomy. Ed. 3. \$6.50. Lea, 1937.
Maximow, A. A., and Bloom, W.: Text-Book of Histology. Ed. 3. \$7. Saunders, 1938.
Morris, Sir Henry: Human Anatomy. Ed. 9, ed. by C. M. Jackson. \$10. Blakiston, 1933.
Piersol, George A. (ed.): Human Anatomy. Ed. 9, rev. under the supervision of G. Carl Huber. \$10. Lippincott, 1930.
Ranson, Stephen W.: Anatomy of the Nervous System. Ed. 6. \$6.50. Saunders, 1939.
Rasmussen, Andrew T.: Principal Nervous Pathways. \$2.50. Macmillan, 1932.
Treat, Sir Frederick: Surgical Applied Anatomy. Rev. by Lambert Rogers. Ed. 10. \$4.50. Lea, 1939.

ANESTHESIA

- Beecher, Henry K.: *Physiology of Anesthesia*. \$3.75. Oxford, 1938.
 Dogliotti, A. M.: *Anesthesia; Narcosis, Local, Regional, Spinal*. Trans. by Carlo S. Scuderi. \$7.50. S. B. Debour, 25 E. Washington St., Chicago, 1939.
 Guedel, Arthur E.: *Inhalation Anesthesia*. \$2.50. Macmillan, 1937.
 Hertzler, Arthur E.: *Technic of Local Anesthesia*. Ed. 6. \$5. Mosby, 1937.
 Hewer, C. Langton: *Recent Advances in Anesthesia and Analgesia (Including Oxygen Therapy)*. Ed. 3. \$5. Blakiston, 1939.
 Maxson, Louis H.: *Spinal Anesthesia*. \$6.50. Lippincott, 1938.
 Noworthy, M. D.: *Theory and Practice of Anaesthesia*. 10s. 6d. Hutchinson, 1935.

CARDIOLOGY

- American Heart Association: *Nomenclature and Criteria for Diagnosis of Diseases of the Heart*. Ed. 4. \$2. Am. Heart Assoc., 1939.
 Barnes, A. R.: *Electrocardiographic Patterns, Their Diagnostic and Clinical Significance*. \$5. Thomas, 1939.
 Fishberg, Arthur M.: *Heart Failure*. \$8.50. Lea, 1937.
 Harrison, Tinsley R.: *Failure of the Circulation*. Ed. 2. \$4.50. Wood, 1939.
 Herrmann, George R.: *Synopsis of Diseases of the Heart and Arteries*. \$4. Mosby, 1936.
 Levine, Samuel A.: *Clinical Heart Disease*. \$5.50. Saunders, 1936.
 Lewis, Sir Thomas: *Clinical Disorders of the Heart Beat*. Ed. 7. \$3. Chicago Med. Bk. Co., 1933.
 Lewis, Sir Thomas: *Diseases of the Heart*. Ed. 2. \$3.50. Macmillan, 1937.
 Pardee, Harold E. B.: *Clinical Aspects of the Electrocardiogram*. Ed. 3. \$5.50. Hoeber, 1933.
 White, Paul D.: *Heart Disease*. Ed. 2. \$7.50. Macmillan, 1937.

DENTISTRY

- Black, G. V.: *Operative Dentistry*. Vol. 1. *Pathology of the Hard Tissues of the Teeth, Oral Diagnosis*; Vol. 2. *Technical Procedures in Making Restorations in the Teeth*; Vol. 3. *The Treatment of Dental Caries*; Vol. 4. *Pathology and Treatment of the Diseases of the Investing Tissues of the Teeth, the Dental Pulp and the Periapical Tissues*. Ed. 7, revised by A. D. Black. \$4.50 volume; \$16 set. Medico-Dental Pub. Co., 1936.
 Blair, Vilray P., and Ivy, R. H.: *Essentials of Oral Surgery*. Ed. 2. \$6.50. Mosby, 1936.
 Kronfeld, R.: *Histopathology of the Teeth and Their Surrounding Structures*. Ed. 2. \$7. Lea, 1939.
 Meyer, W.: *Normal Histology and Histogenesis of the Human Teeth and Associated Parts*. Trans. and ed. by H. R. Churchill. \$4.50. Lippincott, 1935.
 Prinz, H., and Greenbaum, S. S.: *Diseases of the Mouth and Their Treatment*. Ed. 2. \$9. Lea, 1939.
 Thoma, K. H.: *Clinical Pathology of the Jaws*. \$9. Thomas, 1934.

DERMATOLOGY AND SYPHILOLOGY

- Andrews, George C.: *Diseases of the Skin*. Ed. 2. \$10. Saunders, 1938.
 Eller, Joseph J.: *Tumors of the Skin, Benign and Malignant*. \$10. Lea, 1939.
 Goldsmith, William N.: *Recent Advances in Dermatology*. \$5. Blakiston, 1936.
 Harrison, Laurence W.: *Diagnosis and Treatment of Venereal Diseases in General Practice*. Ed. 4. \$8.25. Oxford, 1931.
 MacKee, George M.: *X-rays and Radium in the Treatment of Diseases of the Skin*. Ed. 3. \$10. Lea, 1938.
 MacKenna, Robert W.: *Diseases of the Skin*. Ed. 4, rev. by R. M. B. MacKenna. \$7. Wood, 1937.
 MacLeod, John M. H.: *Diseases of the Skin*. 40s. Lewis, 1933.
 Moore, Joseph E.: *Modern Treatment of Syphilis*. \$5. Thomas, 1933.
 Ormsby, Oliver S.: *Diseases of the Skin. Revision of the Histopathology and Mycology* by C. W. Finerud. Ed. 5. \$12. Lea, 1937.
 Pardo-Castello, V.: *Diseases of the Nails*. \$3.50. Thomas, 1936.
 Schamberg, Jay F., and Wright, C. S.: *Treatment of Syphilis*. \$8. Appleton, 1932.
 Schwartz, Louis, and Tulipan, Louis: *Text-Book of Occupational Diseases of the Skin*. \$10. Lea, 1939.
 Stokes, John H., and others: *Modern Clinical Syphilology*. Ed. 2. \$12. Saunders, 1934.
 Sutton, Richard L., and Sutton, Richard L., Jr.: *Diseases of the Skin*. Ed. 10. \$15. Mosby, 1939.

DIAGNOSIS

- Barton, Wilfred M., and Yater, W. M.: *Symptom Diagnosis, Regional and General*. Ed. 3. \$10. Appleton, 1936.
 Cabot, Richard C., and Adams, F. D.: *Physical Diagnosis*. Ed. 12. \$5. Wood, 1938.
 Cope, Zachary: *Early Diagnosis of the Acute Abdomen*. Ed. 7. \$3.75. Oxford, 1935.
 Elmer, Warren P., and Rose, W. D.: *Physical Diagnosis*. Ed. 8, rev. by Harry Walker. \$8.75. Mosby, 1940.
 French, Herbert (ed.): *Index of Differential Diagnosis of Main Symptoms (Medical and Surgical)*. Ed. 5. \$16. Wood, 1936.
 Graham, Everts A. (ed.): *Surgical Diagnosis*. In 3 volumes. \$35. Saunders, 1930.
 Major, R. H.: *Physical Diagnosis*. \$5. Saunders, 1937.
 Norris, George W., and Landis, H. R. M.: *Diseases of the Chest and the Principles of Physical Diagnosis*. Ed. 6. \$10. Saunders, 1938.
 Osgood, Edwin E.: *Textbook of Laboratory Diagnosis*. Ed. 3. \$6. Blakiston, 1940.
 Stern, Neuton S.: *Clinical Diagnosis, Physical and Differential*. \$3.50. Macmillan, 1933.
 Todd, James C., and Sanford, Arthur H.: *Clinical Diagnosis by Laboratory Methods*. Ed. 9. \$6. Saunders, 1939.
 Wright, Samson: *Applied Physiology*. Ed. 6. \$6. Oxford, 1936.

DIETETICS AND NUTRITION

- American Medical Association: *Council on Foods: Accepted Foods and Their Nutritional Significance*. \$2. A. M. A., 1939.
 American Medical Association: *Council on Foods: The Vitamins*. \$1.50. A. M. A., 1939.
 Barborika, Clifford J.: *Treatment by Diet*. Ed. 4. \$5. Lippincott, 1939.
 Beuret, L. Jean: *Nutrition and Physical Fitness*. Ed. 3. \$3. Saunders, 1939.
 Bridges, Milton A.: *Dietetics for the Clinician*. Ed. 3. \$10. Lea, 1937.
 Bridges, Milton A.: *Food and Beverage Analyses*. \$3.50. Lea, 1935.
 Harris, Leslie J.: *Vitamins in Theory and Practice*. Ed. 3. \$3. Macmillan, 1938.

- League of Nations: *Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy*. \$2. Columbia Univ. Press, 1937.
 League of Nations: *Nutrition Considered in Relation to Public Health and to Economic Conditions*. 15 cents. Columbia Univ. Press, 1937.
 League of Nations: *Technical Commission of the League Health Committee: Report on the Physiological Bases of Nutrition*. 15 cents. Columbia Univ. Press, 1936.
 McCollum, E. V.; Orent-Keiles, E., and Day, H. G.: *The Newer Knowledge of Nutrition*. Ed. 5. \$4.50. Macmillan, 1939.
 McCollum, E. V., and Becker, J. E.: *Food, Nutrition and Health*. Ed. 4. \$1.50. E. V. McCollum, 615 N. Wolfe St., Baltimore, 1937.
 McLester, James S.: *Nutrition and Diet in Health and Disease*. Ed. 1. \$8. Saunders, 1939.
 Pattee, Alida F.: *Practical Dietetics*. Ed. 21. \$3. Alida F. Pattee, 445 Gramatan Ave., Mt. Vernon, N. Y., 1937.
 Rose, Mary S.: *Foundations of Nutrition*. Ed. 3. \$3.50. Macmillan, 1938.
 Rose, Mary S.: *Laboratory Handbook for Dietetics*. Ed. 4. \$3. Macmillan, 1937.
 Sherman, Henry C.: *Chemistry of Food and Nutrition*. Ed. 5. \$13.50. Macmillan, 1937.
 Sherman, Henry C.: *Food Products*. Ed. 3. \$3.25. Macmillan, 1931.

ENDOCRINOLOGY

- Allen, Edgar; Danforth, C. H., and Doisy, E. A. (eds.): *Sex and Internal Secretions*. Ed. 2. \$12. Wood, 1939.
 Bram, Israel: *Exophthalmic Goiter and Its Medical Treatment*. Ed. 1. \$6. Mosby, 1936.
 Cameron, Alexander T.: *Recent Advances in Endocrinology*. Ed. 1. \$5. Blakiston, 1936.
 DuBois, Eugene F.: *Basal Metabolism in Health and Disease*. Ed. 1. \$5. Lea, 1936.
 Endocrines in Theory and Practice. Articles republished from the *British Medical Journal*. \$3.50. Blakiston, 1937.
 Engelbach, William: *Endocrine Medicine*. In 4 volumes. \$15. Thomas, 1932.
 Glandular Physiology and Therapy. A symposium prepared under the auspices of the Council on Pharmacy and Chemistry of the A. M. A. \$2.50. A. M. A., 1936.
 Goldzieher, M. A.: *The Endocrine Glands*. \$10. Appleton, 1939.
 Gregory, Jennie, A. B. C. of the Endocrines. \$3. Wood, 1935.
 Hamblen, E. C.: *Endocrine Gynecology*. \$5.50. Thomas, 1939.
 Hartman, Carl G.: *Time of Ovulation in Women*. \$3. Wood, 1936.
 Hertzler, Arthur E.: *Surgical Pathology of the Thyroid*. \$5. Lippincott, 1936.
 Kurzok, Raphael: *The Endocrines in Obstetrics and Gynecology*. \$7.50. Wood, 1937.
 Rolleston, Sir Humphrey D.: *Endocrine Organs in Health and Disease*. \$13. Oxford, 1936.
 Rowe, Allan Winter: *Differential Diagnosis of Endocrine Disorders*. \$2. Wood, 1932.
 Sevringhaus, E. L.: *Endocrine Therapy in General Practice*. \$2.75. Year Bk. Pubs., 1938.
 Shelling, David H.: *Parathyroids in Health and in Disease*. \$5. Mosby, 1935.
 Van Dyke, H. B.: *Physiology and Pharmacology of the Pituitary Body*. In 2 volumes. \$4.50 per volume. Univ. of Chicago Press, 1939.
 Werner, August A.: *Endocrinology, Clinical Application and Treatment*. \$8.50. Lea, 1937.
 Wolf, William: *Endocrinology in Modern Practice*. Ed. 2. \$10. Saunders, 1939.
 Zondek, Hermann: *Diseases of the Endocrine Glands*. Ed. 3. \$11. Wood, 1935.

FRACTURES AND DISLOCATIONS

- American Medical Association: *Special Exhibit Committee on Fractures: Primer on Fractures*. Ed. 4. \$1. A. M. A., 1938.
 Key, John Albert, and Conwell, H. Earle: *Management of Fractures, Dislocations and Sprains*. Ed. 2. \$12.50. Mosby, 1937.
 Lewin, Philip: *Fractures and Dislocations*. In 2 volumes. \$6. Nat. Med. Bk. Co., 1937.
 Magnuson, Paul B.: *Fractures*. Ed. 3. \$5. Lippincott, 1939.
 Speed, Kellogg: *Text-Book of Fractures and Dislocations*. Ed. 3. \$11. Lea, 1935.
 Spiers, Homer W.: *Brief Outline of Modern Treatment of Fractures*. Ed. 2. \$2. Wood, 1937.
 Watson-Jones, R.: *Fractures and Other Bone and Joint Injuries*. \$6. Livingstone, 1939.
 Wilson, Philip D. (ed.): *Management of Fractures and Dislocations*. \$15. Lippincott, 1938.

HISTORY OF MEDICINE

- Clendening, Logan: *Behind the Doctor*. \$1.69. Garden City Pub. Co., 1936.
 Cushing, Harvey W.: *Life of Dr. William Osler*. In 2 volumes. \$12.50. Oxford, 1925.
 de Kruif, Paul: *Microbe Hunters*. \$1.49. Harcourt, 1939.
 Fishbein, Morris: *Fads and Quackery in Healing*. \$1. Blue Ribbon Books, 14 W. 49th St., New York, 1935.
 Fishbein, Morris: *Frontiers of Medicine*. \$1. Appleton, 1933.
 Garrison, Fielding H.: *Introduction to the History of Medicine*. Ed. 4. \$12. Saunders, 1929.
 Haggard, Howard W.: *Devils, Drugs and Doctors*. \$1. Blue Ribbon Books, 14 W. 49th St., New York, 1933.
 Haggard, Howard W.: *Lame, the Halt, and the Blind*. \$1. Blue Ribbon Books, 14 W. 49th St., New York, 1935.
 Haggard, Howard W.: *Mystery, Magic and Medicine*. \$1. Doubleday, 1933.
 Packard, Francis R.: *History of Medicine in the United States*. In 2 volumes. \$12. Hoeber, 1931.
 Sigerist, Henry E.: *Great Doctors; A Biographical History of Medicine*. Trans. by Eden and Cedar Paul. \$4. Norton, 1933.
 Sigerist, Henry E.: *Man and Medicine*. Trans. by Margaret G. Post. \$4. Norton, 1932.

HOSPITAL ORGANIZATION AND MANAGEMENT

- American Hospital Association: *Report of the Committee on Nomenclature*. \$1. Am. Hosp. Assoc., 1938.
 American Hospital Association: *Interns Manual*. 60 cents. A. M. A., 1938.
 American Medical Association: *Standard Classified Nomenclature of Disease*. Ed. 2. \$3.50. A. M. A., 1935.

Hospital Internships and Residencies in New York City, 1934-1937. New York Committee on the Study of Hospital Internships and Residencies. \$2.50. Commonwealth Fund, 1938.
Interns Handbook: Prepared under direction of M. S. Dooley. Ed. 2. \$3. Lippincott, 1938.
Jones, E. Kathleen: Hospital Libraries. \$2.50. Am. Library Assoc., 1939.
MacEachern, Malcolm T.: Hospital Organization and Management. \$7.50. Physicians Record Co., 1935.
MacEachern, Malcolm T.: Medical Records in the Hospital. \$3. Physicians Record Co., 1937.
Mills, Alden B.: Hospital Public Relations. \$3.75. Physicians Record Co., 1939.
Morrill, Warren P.: Hospital Manual of Operation. \$3. Lakeside Pub. Co., 1934.
Morse, Minnie G.: Hospital Case Records and the Record Librarian. \$1. Physicians Record Co., 1934.
Ponton, Thomas R.: Medical Staff in the Hospital. \$2.50. Physicians Record Co., 1939.
Stone, J. E.: Hospital Organization and Management. Ed. 3. 31s. 6d. Faber and Faber, 1939.

INFECTIOUS DISEASES, HYGIENE AND PREVENTIVE MEDICINE

Boyd, Mark F.: Preventive Medicine. Ed. 5. \$4.50. Saunders, 1936.
Budd, William: Typhoid Fever, Its Nature, Mode of Spreading, and Prevention. \$5. Limited de luxe Ed., \$10. Am. Pub. Health Assoc., 1931.
Dunham, George C.: Military Preventive Medicine. Ed. 3. \$2.50. Bk. Shop, Carlisle Barracks, Carlisle, Pa., 1938.
Gay, Frederick P., and others: Agents of Disease and Host Resistance. \$10. Thomas, 1935.
Jordan, Edwin O.: Textbook of General Bacteriology. Ed. 12. \$6. Saunders, 1938.
Mustard, H. S.: Rural Health Practice. \$4. Commonwealth Fund, 1936.
Paran, Thomas: Shadow on the Land, Syphilis. \$2.50. Wood, 1937.
Rosenau, Milton J., and others: Preventive Medicine and Hygiene. Ed. 6. \$10. Appleton, 1935.
Smillie, Wilson G.: Public Health Administration in the United States. \$3.50. Macmillan, 1935.
Snow, John: Snow on Cholera, Together with a Biographical Memoir by B. W. Richardson. \$2.50. Commonwealth Fund, 1936.
Stimson, Philip M.: A Manual of the Common Contagious Diseases. Ed. 2. \$4. Lea, 1936.
Zinsser, Hans; Enders, John F., and Fothergill, Leroy D.: Immunity, Principles and Application in Medicine and Public Health. Ed. 5. \$6.50. Macmillan, 1939.

MEDICAL DICTIONARIES

Dorland, William A. N., and Miller, E. C. LeR.: American Illustrated Medical Dictionary. Ed. 18. \$7. With thumb index, \$7.50. Saunders, 1938.
Gould, George M.: Medical Dictionary. Ed. 4. \$7. With thumb index, \$7.50. Blakiston, 1935.
Lang, Hugo: German-English Dictionary of Terms Used in Medicine and the Allied Sciences. Ed. 4. \$10. Blakiston, 1932.
Stedman, Thomas L.: Practical Medical Dictionary. Ed. 14. \$7. With thumb index, \$7.50. Wood, 1939.

MEDICAL JURISPRUDENCE, LEGAL MEDICINE AND TOXICOLOGY

American Medical Association, Bureau of Legal Medicine and Legislation: Medicolegal Cases: Abstracts of Court Decisions, 1926 to 1930 Inclusive. \$7. A. M. A., 1932. Medicolegal Cases: Abstracts of Court Decisions, 1931 to 1935 Inclusive. \$5.50. A. M. A., 1936.
Brahdy, Leopold, and Kahn, Samuel (eds.): Trauma and Disease. \$7.50. Lea, 1937.
Brothers, Elmer D.: Medical Jurisprudence. Ed. 3. \$3.50. Mosby, 1930.
Glaister, John: Medical Jurisprudence and Toxicology. Ed. 6. \$8. Wood, 1938.
Gonzales, Thomas A.; Vance, Morgan, and Helsen, Milton: Legal Medicine and Toxicology. \$10. Appleton, 1937.
Hayt, Emanuel, and Hayt, L. R.: Legal Aspects of Hospital Practices. \$2. Hoes. Textbook Co., 1938.
Herzog, Alfred W.: Medical Jurisprudence. \$15. Bobbs, 1931.
Kessler, Henry H.: Accidental Injuries: The Medico-Legal Aspects of Workmen's Compensation and Public Liability. \$10. Lea, 1931.
McBride, Earl D.: Disability Evaluation. Ed. 2. \$8. Lippincott, 1938.
Smith, Sydney A.: Forensic Medicine: A Text-Book for Students and Practitioners. Ed. 6. 24s. Churchill, 1938.
Smith, Sydney A., and Glaister, John: Recent Advances in Forensic Medicine. Ed. 2. \$4.50. Blakiston, 1939.
Spicer, Frank W.: Trauma and Internal Disease. \$7. Lippincott, 1939.
Webster, Ralph W.: Legal Medicine and Toxicology. \$8.50. Saunders, 1930.

MEDICINE

Barr, David P. (ed.): Modern Medical Therapy in General Practice. In 3 volumes. \$35. Williams and Wilkins, 1940.
Beaumont, George E., and Dadds, E. C.: Recent Advances in Medicine. Ed. 9. \$5. Blakiston, 1939.
Beckman, Harry: Treatment in General Practice. Ed. 3. \$10. Saunders, 1938.
Blumer, George (supervising ed.): Practitioners Library of Medicine and Surgery. In 13 volumes. \$10 per volume. Appleton, 1932-
Cecil, Russell L. (ed.): Textbook of Medicine. By American authors. Ed. 4. \$9. Saunders, 1937.
Clendenning, Logan: Methods of Treatment. Ed. 6. \$10. Mosby, 1937.
Conybeare, John J. (ed.): Textbook of Medicine. By various authors. Ed. 4. \$6.75. Wood, 1939.
Eusterman, G. B., and Balfour, D. C.: Stomach and Duodenum. \$10. Saunders, 1935.
Feinberg, Samuel M.: Allergy in General Practice. \$4.50. Lea, 1934.
Fishberg, Arthur M.: Hypertension and Nephritis. Ed. 4. \$7.50. Lea, 1939.
Jensen, H. F.: Insulin, Its Chemistry and Physiology. \$2. Commonwealth Fund, 1938.
Joslin, Elliott P.: Diabetic Manual. Ed. 6. \$2. Lea, 1937.

Joslin, Elliott P., et al.: Treatment of Diabetes Mellitus. Ed. 6. \$7. Lea, 1937.
Lawrence, Robert D.: Diabetic Life, Its Control by Diet and Insulin. Ed. 11. \$3. Blakiston, 1939.
Manson-Bahr, Philip H.: The Dysenteric Disorders. \$8. Wood, 1939.
Meakins, Jonathan C.: Practice of Medicine. Ed. 2. \$12.50. Mosby, 1938.
Musser, John H. (ed.): Internal Medicine, Its Theory and Practice. Ed. 3. \$10. Lea, 1938.
Nelson New Loose-Leaf Medicine. Editor-in-Chief, W. W. Herrick. In 9 volumes, including index. \$100. Nelson, 1920-1939.
Norris, George W., and Landis, H. R. M.: Diseases of the Chest and the Principles of Physical Diagnosis. Ed. 6. \$10. Saunders, 1938.
Osler, Sir William: Principles and Practice of Medicine. Ed. 13, rev. by H. A. Christian. \$9. Appleton, 1938.
Oxford Loose-Leaf Medicine. Editor, H. A. Christian. In 7 volumes and index volume. \$125. Oxford, 1920-1940.
Oxford Monographs on Diagnosis and Treatment. Ed. by H. A. Christian. In 10 volumes. \$100. Oxford, 1928-1939.
Price, Frederick W.: Textbook of the Practice of Medicine. Ed. 5. \$12.50. Oxford, 1937.
Rehberger, George E.: Lippincott's Quick Reference Book for Medicine and Surgery. Ed. 10. \$15. Lippincott, 1937.
Rehfuß, Martin E., and Nelson, G. M.: Medical Treatment of Gall-bladder Disease. \$5.50. Saunders, 1935.
Tice, Frederick; Friedenwald, Julius; Shelton, E. Kost, and Grinker, Roy R. (eds.): Practice of Medicine. In 10 volumes. \$115. Prior, 1939.
Vaughan, Warren T.: Allergy and Applied Immunology. Ed. 2. \$5. Mosby, 1934.
White, Paul Dudley: Heart Disease. Ed. 2. \$7.50. Macmillan, 1937.
Yearbook of General Medicine. Ed. by George F. Dick and others. \$3. Year Bk. Pubs., 1939.

MISCELLANEOUS

American Medical Association: Principles of Medical Ethics. Single copy, 5 cents; 12 copies, 50 cents, prepaid; 50 copies or more, each 4 cents, prepaid. A. M. A.
Goepff, Rudolph M.: Medical State Board Questions and Answers. Ed. 7. \$5.50. Saunders, 1938.
Rypins, Harold: Medical State Board Examinations. Ed. 4. \$4.50. Lippincott, 1939.

NEUROLOGY AND PSYCHIATRY

Association for Research in Nervous and Mental Disease: Infections of the Central Nervous System. \$7.50. Williams and Wilkins, 1932.
Cushing, Harvey W.: Intracranial Tumors. \$5. Thomas, 1932.
Dayton, Neil A.: New Facts on Mental Disorders. \$4.50. Thomas, 1940.
Freeman, Walter J.: Neuropathology: The Anatomical Foundation of Nervous Diseases. \$4. Saunders, 1933.
Grinker, Roy R.: Neurology. Ed. 2. \$8.50. Thomas, 1937.
Hart, Bernard: Psychology of Insanity. Ed. 4. \$1. Macmillan, 1931.
Henderson, David K., and Gillespie, R. D.: Text-Book of Psychiatry. Ed. 4. \$6. Oxford, 1936.
Herrick, Charles J.: Introduction to Neurology. Ed. 5. \$3. Saunders, 1931.
Jennings, H. S.: Biological Basis of Human Nature. \$4. Norton, 1930.
Monrad-Krohn, G. H.: Clinical Examination of the Nervous System. Ed. 7. \$3. Hoeber, 1938.
National Research Council, Committee on Psychiatric Investigations: The Problem of Mental Disorder. \$4. McGraw-Hill, 1934.
Noyes, A. P.: Textbook of Psychiatry. Ed. 2. \$2.50. Macmillan, 1936.
Parkinson, James A.: Shaking Palsy—An Essay. \$1.25. A. M. A.
Penrose, Lionel S.: Mental Defect. \$2.75. Farrar, 1934.
Ross, Thomas A.: Common Neuroses. Ed. 2. \$4. Wood, 1937.
Strecker, Edward A., and Ebaugh, F. G.: Practical Clinical Psychiatry. Ed. 4. \$5. Blakiston, 1935.
Tilney, Frederick, and Riley, Henry A.: Forms and Functions of the Central Nervous System. Ed. 3. \$10. Hoeber, 1938.
Villiger, Emil: Brain and Spinal Cord. Ed. 4. \$5. Lippincott, 1931.
Wechsler, Israel S.: Text-Book of Clinical Neurology. Ed. 4. \$7. Saunders, 1939.
White, William A.: Outlines of Psychiatry. Ed. 14. \$4. Nerv. and Ment. Dis. Pub. Co., 1935.

OBSTETRICS AND GYNECOLOGY

Ansbach, Brooke M., et al.: Gynaecology. Ed. 5. \$9. Lippincott, 1934.
Beck, Alfred C.: Obstetrical Practice. Ed. 2. \$7. Wood, 1939.
Blair-Bell, William: Principles of Gynecology. Ed. 4. \$10. Wood, 1934.
Crossen, Harry S., and Crossen, R. J.: Diseases of Women. Ed. 8. \$10. Mosby, 1935.
Crossen, Harry S., and Crossen, R. J.: Operative Gynecology. Ed. 5. \$12.50. Mosby, 1938.
Curtis, Arthur H.: Text-Book of Gynecology. Ed. 3. \$7. Saunders, 1938.
Curtis, Arthur H. (ed.): Obstetrics and Gynecology. In 3 volumes. \$35. Saunders, 1933.
Davis, Carl H. (ed.): Gynecology and Obstetrics. In 3 volumes. \$35. Prior, 1939.
De Lee, Joseph B.: Principles and Practice of Obstetrics. Ed. 7. \$12. Saunders, 1938.
Fluhmann, C. Frederic: Menstrual Disorders; Pathology, Diagnosis and Treatment. \$5. Saunders, 1939.
Greenhill, J. P.: Obstetrics for the General Practitioner. \$3. Nat. Med. Bk. Co., 1935.
Greenhill, J. P.: Office Gynecology. \$3. Year Bk. Pubs., 1939.
Jamson, Edwin M.: Obstetrics and Gynecology. \$2. Hoeber, 1936.
Johnstone, Robert W.: Text-Book of Midwifery. Ed. 10. 18s. Black, 1939.
Kerr, John M. M., and others: Combined Text-Book of Obstetrics and Gynecology. Ed. 3. 37s. 6d. Livingstone, 1939.
Miller, Charles Jefferson: Introduction to Gynecology. Ed. 2. \$6. Mosby, 1934.
Schumann, Edward A.: A Textbook of Obstetrics. \$6.50. Saunders, 1936.
Tausig, Frederick J.: Abortion, Spontaneous and Induced: Medical and Social Aspects. \$5. Mosby, 1936.
Thoms, Herbert: Chapters in American Obstetrics. \$2. Thomas, 1932.
Williams, J. Whitridge: Obstetrics. Ed. 7, rev. by Henricus J. Stander. \$10. Appleton, 1936.
Year Book of Obstetrics and Gynecology. Ed. by Joseph B. De Lee and J. P. Greenhill. \$2.50. Year Bk. Pubs., 1940.

OPHTHALMOLOGY

- Adler, Francis H.: *Clinical Physiology of the Eye*. \$5. Macmillan, 1933.
- Berens, Conrad (ed.): *The Eye and Its Diseases*. \$12. Saunders, 1936.
- Duke-Elder, Sir W. Stewart: *Practice of Refraction*. Ed. 3. \$4.50. Blakiston, 1938.
- Duke-Elder, Sir W. Stewart: *Textbook of Ophthalmology*. In 4 volumes. \$18.50 per volume. Mosby, 1937.
- Gifford, Sanford R.: *Handbook of Ocular Therapeutics*. Ed. 2. \$3.75. Lea, 1937.
- May, Charles H.: *Manual of the Diseases of the Eye*. Ed. 16. \$4. Wood, 1939.
- Parsons, Sir John H.: *Diseases of the Eye*. Ed. 9. \$5.50. Macmillan, 1938.
- Peter, Luther C.: *The Extra-Ocular Muscles*. Ed. 2. \$4.50. Lea, 1936.
- Thorington, James: *Refraction of the Human Eye and Methods of Estimating the Refraction*. Ed. 3, rev. and ed. by J. Monroe Thorington. \$3.50. Blakiston, 1939.
- Traquair, H. M.: *An Introduction to Clinical Perimetry*. Ed. 3. \$9. Mosby, 1938.
- Whitnall, S. Ernest: *Anatomy of the Human Orbit and Accessory Organs of Vision*. Ed. 2. \$9. Oxford, 1932.
- Wilmer, W. H.: *Atlas Fundus Oculi*. \$38. Macmillan, 1934.
- Wolff, Eugene: *Anatomy of the Eye and Orbit*. \$7.50. Blakiston, 1933.

ORTHOPEDIC SURGERY

- Campbell, Willis C.: *Operative Orthopedics*. \$12.50. Mosby, 1939.
- Mercer, Walter: *Orthopedic Surgery*. Ed. 2. \$10. Wood, 1936.
- Steindler, Arthur: *Orthopedic Operations; Indications, Technique and End Results*. \$9. Thomas, 1940.
- Whitman, Royal: *Treatise on Orthopaedic Surgery*. Ed. 9. \$10. Lea, 1930.

OTORHINOLARYNGOLOGY

- Ballenger, William L.: *Diseases of the Nose, Throat and Ear*. Ed. 7, rev. by Howard C. Ballenger. \$11. Lea, 1938.
- Fowler, Edmund Prince, Jr. (ed.): *Medicine of the Ear*. \$12. Nelson, 1939.
- Hansel, French K.: *Allergy of the Nose and Paranasal Sinuses*. \$7. Mosby, 1936.
- Imperatori, Charles J., and Burman, Herman J.: *Diseases of the Nose and Throat*. Ed. 2. \$7. Lippincott, 1939.
- Jackson, Chevalier: *Bronchoscopy, Esophagoscopy, and Gastroscopy*. Ed. 3. \$9. Saunders, 1934.
- Jackson, Chevalier, and Jackson, C. L.: *Diseases of the Air and Food Passages of Foreign-Body Origin*. \$12.50. Saunders, 1936.
- Kerrison, Philip D.: *Diseases of the Ear*. Ed. 4. \$5.50. Lippincott, 1930.
- Kopetzky, Samuel J. (ed.): *Surgery of the Ear*. \$12. Nelson, 1938.
- Lederer, Francis L.: *Diseases of the Ear, Nose and Throat*. Ed. 2. \$10. Davis, 1939.
- Morrison, W. Wallace: *Diseases of the Nose, Throat and Ear*. \$5.50. Saunders, 1938.
- Portmann, Georges: *Treatise on the Surgical Technique of Otorhinolaryngology*. Trans. by Pierre Violé. \$12.50. Wood, 1939.
- Turner, A. Logan, et al.: *Diseases of the Nose, Throat and Ear*. Ed. 4. \$6. Wood, 1936.
- Year Book of the Eye, Ear, Nose and Throat. Ed. by Edward V. L. Brown and others. \$2.50. Year Bk. Pubs., 1939.

PATHOLOGY, BACTERIOLOGY AND CLINICAL LABORATORY WORK

- Boyd, William: *Pathology of Internal Diseases*. Ed. 2. \$10. Lea, 1935.
- Boyd, William: *Surgical Pathology*. Ed. 4. \$10. Saunders, 1938.
- Clifford, Randall: *Sputum, Its Examination and Clinical Significance*. \$4. Macmillan, 1932.
- Ewing, James: *Neoplastic Diseases*. Ed. 3. \$14. Saunders, 1928.
- Gradwohl, Rutherford B. H.: *Clinical Laboratory Methods and Diagnosis*. Ed. 2. \$12.50. Mosby, 1938.
- Jordan, Edwin O.: *Text-Book of General Bacteriology*. Ed. 12. \$6. Saunders, 1938.
- Karsner, Howard T.: *Human Pathology*. Ed. 5. \$10. Lippincott, 1938.
- Kaufmann, Eduard: *Pathology for Students and Practitioners*. Trans. by S. P. Reimann. In 3 volumes. \$30. Blakiston, 1929.
- Kolmer, John A., and Boerner, F.: *Approved Laboratory Technic*. Ed. 2. \$8. Appleton, 1938.
- Levinson, S. A., and MacFate, R. P.: *Clinical Laboratory Diagnosis*. \$9.50. Lea, 1937.
- MacCallum, William G.: *Text-Book of Pathology*. Ed. 6. \$10. Saunders, 1936.
- Park, William H., and Williams, A. W.: *Pathogenic Microorganisms*. Ed. 11. \$8. Lea, 1939.
- Piney, Alfred: *Recent Advances in Haematology*. Ed. 4. \$5. Blakiston, 1939.
- Rice, Thurman B.: *Textbook of Bacteriology*. Ed. 2. \$5. Saunders, 1938.
- Sherwood, N. P.: *Immunology*. \$6. Mosby, 1935.
- Stitt, E. R.: *Practical Bacteriology, Haematology, and Animal Parasitology*. Ed. 9. \$7. Blakiston, 1938.
- Topley, William W. C., and Wilson, G. S.: *Principles of Bacteriology and Immunity*. In 2 volumes. Ed. 2. \$12. Wood, 1936.
- Zinsser, Hans, and Bayne-Jones, S.: *Textbook of Bacteriology*. Ed. 8. \$8. Appleton, 1939.

PEDIATRICS

- Aldrich, C. A., and Aldrich, M. M.: *Babies Are Human Beings*. \$1.75. Macmillan, 1938.
- Brennemann, Joseph (ed.): *Practice of Pediatrics*. In 4 volumes. \$56. Prior, 1939.
- Brown, A. G., and Tisdall, F. F.: *Common Procedures in the Practice of Pediatrics*. Ed. 3. \$5. McClelland, 1939.
- Chapin, Henry D., and Royster, L. T.: *Pediatrics*. Ed. 7. \$7. Wood, 1933.
- Davidson, Wilburt C.: *Complete Pediatrician*. Ed. 2. \$3.75. Duke Univ., 1938.
- Garrod, Sir Archibald Edward (ed.): *Diseases of Children*. Ed. 3. \$10. Wood, 1934.
- Griffith, John P. C., and Mitchell, A. G.: *Diseases of Infants and Children*. Ed. 2. \$10. Saunders, 1937.

- Holt, Luther E., and Howland, John: *Diseases of Infancy and Childhood*. Rev. by L. E. Holt, Jr. and Rustin McIntosh. Ed. 10. \$1. Appleton, 1936.
- Hutchison, Robert: *Lectures on Diseases of Children*. Ed. 7. \$10. Wood, 1935.
- Kanner, Leo: *Child Psychiatry*, with prefs. by Adolph Meyer and Edwards A. Park. \$6. Thomas, 1935.
- Marriott, Williams M.: *Infant Nutrition*. Ed. 2. \$4.50. Mosby, 1933.
- Paterson, D. H.: *Sick Children, Diagnosis and Treatment*. Ed. 1. \$1.6d. Cassell, 1938.
- Pfaundler, M., and Schlossmann, A. (eds.): *Diseases of Children*. In 5 volumes. Trans. by M. G. Peterman. \$22.50. Lippincott, 1931.
- Porter, Langley, and Carter, W. E.: *Management of the Sick Infant and Child*. Ed. 5. \$10. Mosby, 1938.
- Tow, Abraham: *Diseases of the Newborn*. \$6.50. Oxford, 1937.

PHARMACOLOGY AND THERAPEUTICS

- American Medical Association: *Indispensable Use of Narcotics*. Prepared in cooperation with the National Research Council and U. S. Public Health Service. \$1.25. A. M. A., 1931.
- American Medical Association: *New and Nonofficial Remedies*. Published annually. \$1.50. A. M. A.
- American Medical Association: *Nostrums and Quackery*. Ed. by Arthur J. Cramp. Vol. II, \$1.50. A. M. A., 1921. Vol. III, \$1.50. A. M. A., 1936.
- American Medical Association. Council on Pharmacy and Chemistry: *The Pharmacopoeia and the Physician*. \$1.50. A. M. A., 1939.
- American Medical Association. Council on Pharmacy and Chemistry: *Epitome of the Pharmacopoeia of the United States and the National Formulary*. Ed. 5. 60 cents. A. M. A., 1937.
- American Medical Association. Council on Pharmacy and Chemistry: *Useful Drugs*. Ed. 10. 75 cents. A. M. A., 1936.
- Arny, H. V., and Fischel, R. P.: *Principles of Pharmacy*. Ed. 4. \$1. Saunders, 1937.
- Bastedo, Walter A.: *Materia Medica, Pharmacology, Therapeutics and Prescription Writing*. Ed. 4. \$6.50. Saunders, 1937.
- Clark, Alfred J.: *Applied Pharmacology*. Ed. 6. \$5. Blakiston, 1938.
- Cushny, Arthur R.: *Text-Book of Pharmacology and Therapeutics*. Ed. 11, rev. by C. W. Edmunds and J. A. Gunn. \$6.50. Lea, 1938.
- Fantus, Bernard: *General Technic of Medication*. Ed. 3. \$2. A. M. A., 1938.
- Leschke, Erich: *Clinical Toxicology*. Trans. by C. P. Stewart and O. Dorner. \$4. Williams and Wilkins, 1934.
- National Formulary. Ed. 6. \$5. Leather, \$6. For sale by Mack Ptg. Co., 20th & Northampton Sts., Easton, Pa., 1936.
- Osborne, Oliver T., and Fishbein, Morris: *Handbook of Therapy*. Ed. 11. \$2. A. M. A., 1937.
- Pharmaceutical Recipe Book. Ed. 2. Buckram, \$5. Leather, \$6. For sale by Mack Ptg. Co., 20th & Northampton Sts., Easton, Pa., 1936.
- Pharmacopoeia of the United States of America*. Eleventh Decennial Revision. Buckram, \$5. Leather, \$6. For sale by Mack Ptg. Co., 20th & Northampton Sts., Easton, Pa., 1936.
- Sollmann, Torald H.: *Manual of Pharmacology and Its Applications to Therapeutics and Toxicology*. Ed. 5. \$7.50. Saunders, 1936.
- Wood, Horatio C., Jr., and Others: *Dispensatory of the United States of America*. Ed. 22. Buckram, \$15. With thumb index, \$15.75. Lippincott, 1937.

PHYSICAL THERAPY

- American Medical Association. Council on Physical Therapy: *Handbook of Physical Therapy*. Ed. 3. \$2. A. M. A., 1939.
- Bierman, William: *Medical Applications of the Short Wave Current*. \$5. Wood, 1938.
- Coulter, John S.: *History of Physical Therapy*. \$1.50. Hoeber, 1932.
- Davis, John E., and Duntun, W. R.: *Principles and Practice of Recreational Therapy for the Mentally Ill*. \$3. Barnes, 1936.
- Girard, Percy M.: *Home Treatment of Spastic Paralysis*. \$2. Lippincott, 1937.
- Kovács, Richard: *Electrotherapy and Light Therapy*. Ed. 3. \$7.50. Lea, 1938.
- Kovács, Richard: *Physical Therapy for Nurses*. \$2.75. Lea, 1936.
- Krusen, Frank H.: *Light Therapy*. Ed. 2. \$3.50. Hoeber, 1937.
- Krusen, Frank H.: *Physical Therapy in Arthritis*. \$2.25. Hoeber, 1937.
- Laurens, Henry: *Physiological Effects of Radiant Energy*. \$6. Reinhold, 1933.
- Lewis, Sir Thomas: *Vascular Disorders of the Limbs*. \$2. Macmillan, 1936.
- Mayer, Edgar: *Curative Value of Light*. \$1.50. Appleton, 1932.
- Mock, Harry E., Pemberton, Ralph, and Coulter, J. S. (eds.): *Principles and Practice of Physical Therapy*. In 3 volumes. \$35. Prior, 1939.
- Phelps, Winthrop M., and Kipthuth, R. J. H.: *Diagnosis and Treatment of Postural Defects*. \$4. Thomas, 1932.
- Pollock, Lewis J., and Davis, L. E.: *Peripheral Nerve Injuries*. \$10. Hoeber, 1933.
- Rogers, Gladys G., and Thomas, Leah C.: *New Pathways for Children with Cerebral Palsy*. \$2.50. Macmillan, 1935.
- Year Book of Physical Therapy: Ed. by Richard Kovács. \$2.50. Year Bk. Pubs., 1939.

PHYSIOLOGY AND BIOCHEMISTRY

- Annual Review of Biochemistry. In 2 volumes. \$5 per volume. Stanford Press, 1938-1939.
- Annual Review of Physiology. \$5. Stanford Press, 1939.
- Bard, Philip, and others (eds.): *MacLeod's Physiology in Modern Medicine*. Ed. 8. \$8.50. Mosby, 1938.
- Nest, C. H., and Taylor, N. B.: *Physiological Basis of Medical Practice*. Ed. 2. \$10. Wood, 1939.
- Bolányi, Meyer: *Introduction to Physiological Chemistry*. Ed. 4. \$1. Wiley, 1938.
- Cantarow, Abraham, and Trumper, Max: *Clinical Biochemistry*. Ed. 2. \$6. Saunders, 1939.
- Fulton, J. F. (ed.): *Selected Readings in the History of Physiology*. \$5. Thomas, 1930.
- Harrington, Charles R.: *Thyroid Gland, Its Chemistry and Physiology*. \$5.25. Oxford, 1933.
- Harrow, Benjamin, and Sherwin, Carl P. (eds.): *Textbook of Biochemistry*. \$6. Saunders, 1935.

- Hawk, P. B., and Bergeim, O.: Practical Physiological Chemistry. Ed. 11. \$8. Blakiston, 1937.
- Howell, William H.: Text-Book of Physiology. Ed. 13. \$7. Saunders, 1936.
- Mathews, Albert P.: Principles of Biochemistry. \$4.50. Wood, 1936.
- Moon, V. H.: Shock and Related Capillary Phenomena. \$3.50. Oxford, 1938.
- Newton, W. H. (ed.): Evans' Recent Advances in Physiology. Ed. 6. \$5. Blakiston, 1939.
- Peters, John P.: Body Water. \$4. Thomas, 1935.
- Shohl, A. T.: Mineral Metabolism. \$5. Reinhold, 1939.
- Wiggers, Carl J.: Physiology in Health and Disease. Ed. 3. \$9.50. Lea, 1939.

PROCTOLOGY

- Bacon, H. E.: Anus, Rectum, Sigmoid Colon; Diagnosis and Treatment. \$8.50. Lippincott, 1938.
- Buie, Louis A.: Practical Proctology. \$6.50. Saunders, 1937.
- Hayden, E. Parker: Rectum and Colon. \$5.50. Lea, 1939.
- Hirschman, Louis J.: A Synopsis of Ano-Rectal Diseases. \$3.50. Mosby, 1937.
- Lockhart-Mummery, J. Percy: Diseases of the Anus, Rectum and Colon and Their Surgical Treatment. Ed. 2. \$10. Wood, 1934.
- Rankin, Fred W., and Graham, A. S.: Cancer of the Colon and Rectum, Its Diagnosis and Treatment. \$5.50. Thomas, 1939.
- Smith, Frederick C.: Proctology for the General Practitioner. \$4.50. Davis, 1939.

RADIOLOGY

- Barclay, Alfred E.: Digestive Tract, A Radiological Study of Its Anatomy, Physiology, and Pathology. Ed. 2. \$12. Macmillan, 1937.
- Brailsford, James F.: Radiology of Bones and Joints. Ed. 2. \$9. Wood, 1935.
- Cutler, Max, and Buschke, Franz: Cancer, Its Diagnosis and Treatment. \$10. Saunders, 1938.
- Glasser, Otto (ed.): Science of Radiology. \$4.50. Thomas, 1933.
- Glasser, Otto: Wilhelm Conrad Röntgen and the Early History of the Roentgen Rays. \$3. Thomas, 1935.
- Golden, Ross (ed.): Diagnostic Roentgenology. \$20. Nelson, 1936.
- Köhler, Alban: Röntgenology, The Borderlands of the Normal and Early Pathological in the Skiagram. Ed. 2. Trans. by Arthur Turnbull. \$14. Wood, 1935.
- Pohle, Ernst A. (ed.): Clinical Roentgen Therapy. \$10. Lea, 1938.
- Rigler, Leo G.: Outline of Roentgen Diagnosis. Atlas Ed. \$6.50. Lippincott, 1938.
- Sante, LeRoy: Manual of Roentgenological Technique. Ed. 6. \$4.50. Edwards Bros., 1939.
- Shanks, S. C.; Kerley, P. J., and Twining, E. W. (eds.): A Text-book of X-Ray Diagnosis. In 3 volumes. Vol. I, 50s. Vol. II, 42s. Vol. III, £3. 3s. Lewis, 1938-1940.
- Ward, William R., and Smith, A. J. D.: Recent Advances in Radium. \$5. Blakiston, 1933.
- Year Book of Radiology. Ed. by Chas. A. Waters, Whitmer B. Firor, and Ira I. Kaplan. \$4.50. Year Bk. Pubs., 1939.

SURGERY

- Balcock, W. Wayne: Text-Book of Surgery. Ed. 2. \$10. Saunders, 1935.
- Bailey, Percival: Intracranial Tumors. \$6. Thomas, 1933.
- Cheate, Sir George L., and Cutler, Max: Tumours of the Breast. 50s. Arnold, 1931.
- Christopher, Frederick: Minor Surgery. Ed. 3. \$10. Saunders, 1936.
- Christopher, Frederick (ed.): Textbook of Surgery, by American authors. Ed. 2. \$10. Saunders, 1939.
- Cole, Warren H., and Elman, Robert: Textbook of General Surgery. Ed. 2. \$8. Appleton, 1939.
- Collens, William S., and Wilensky, N. D.: Peripheral Vascular Diseases. \$4.50. Thomas, 1939.
- Cutler, Elliott C., and Zollinger, Robert: Atlas of Surgical Operations. \$8. Macmillan, 1939.
- Eliason, Eldridge L.: First Aid in Emergencies. Ed. 9. \$1.75. Lippincott, 1938.
- Eliason, Eldridge L.: Practical Bandaging. Ed. 5. \$1.75. Lippincott, 1938.
- Geschickter, Charles F., and Copeland, M. M.: Tumors of Bone. Rev. ed. \$6. American Journal of Cancer, 654 Madison Ave., New York, 1936.
- Hietzler, Arthur E., and Chesky, V. E.: Surgery of a General Practice. \$7.50. Mosby, 1935.
- Homans, John (comp.): Textbook of Surgery. Ed. 5. \$8. Thomas, 1940.
- Horgan, Edmund: Reconstruction of the Biliary Tract. \$4. Macmillan, 1932.
- Horsley, John S., and Bigger, Isaac A.: Operative Surgery. In 2 volumes. Ed. 4. \$15. Mosby, 1937.
- Knave, A. B.: Infections of the Hand. Ed. 7. \$6. Lea, 1939.
- Kirschner, Martin: Operative Surgery. Trans. by I. S. Ravdin and George M. Coates (Vol. III only). In 3 volumes. \$12 per volume. Lippincott, 1937.
- Lewis, Dean De Witt, and others (eds.): Practice of Surgery. By various authors. In 12 volumes. \$137. Prior, 1939.
- Mason, R. L.: Preoperative and Postoperative Treatment. \$6. Saunders, 1937.
- Nelson New Looe-Leaf Surgery. Editor-in-Chief, Allen O. Whipple. In 9 volumes, including index. \$110. Nelson, 1927-1939.
- Scudder, Charles L.: Treatment of Fractures. Ed. 11. \$12. Saunders, 1938.
- Sheehan, J. Eastman: Manual of Reporative Plastic Surgery. \$5.50. Hoeber, 1938.
- Stout, A. P.: Human Cancer. \$10. Lea, 1932.
- Walters, Waltman, and Snell, A. M.: Diseases of the Gallbladder and Bile Ducts. \$10. Saunders, 1940.

TUBERCULOSIS

- Alexander, John: Collapse Therapy of Pulmonary Tuberculosis. \$15. Thomas, 1937.
- Brown, Lawrason: Rules for Recovery from Pulmonary Tuberculosis. Ed. 6. \$1.75. Lea, 1934.
- Brown, Lawrason, and Heise, F. H. C.: Lungs, and the Early Stages of Tuberculosis. \$1.50. Appleton, 1931.

- Brown, Lawrason, and Sampson, H. L.: Intestinal Tuberculosis. Ed. 2. \$4.75. Lea, 1930.
- Burke, Richard M.: A Historical Chronology of Tuberculosis. \$1.50. Thomas, 1938.
- Burrell, Lancelot S. T.: Artificial Pneumothorax. 12s. 6d. Heinemann, 1932.
- Burrell, Lancelot S. T.: Recent Advances in Pulmonary Tuberculosis. Ed. 3. \$5. Blakiston, 1937.
- Feldman, William H.: Avian Tuberculosis Infections. \$7. Wood, 1938.
- Goldberg, Benjamin (ed.): Clinical Tuberculosis; with the collaboration of the following contributors: Donato G. Alarcon and others. In 2 volumes. Ed. 2. \$15. Davis, 1939.
- Graham, Evarts A.; Singer, J. J., and Ballon, H. C.: Surgical Diseases of the Chest. \$15. Lea, 1935.
- Myers, J. A.: Tuberculosis Among Children and Young Adults. Ed. 2. \$4.50. Thomas, 1938.
- Oatway, William H., Jr.: Management of Tuberculosis in General Hospitals, Council on Professional Practice of American Hospital Association. \$1. Am. Hosp. Assoc., 1939.
- Straub, George F.: Surgery of the Chest. \$5.50. Thomas, 1932.
- Wells, Harry Gideon, and Long, E. R.: Chemistry of Tuberculosis. Ed. 2. \$7. Williams and Wilkins, 1932.

UROLOGY

- Beer, Edwin: Tumors of the Urinary Bladder. \$3.50. Wood, 1935.
- Cabot, Hugh (ed.): Modern Urology. In 2 volumes. Ed. 3. \$20. Lea, 1936.
- Herman, Leon: Practice of Urology. \$10. Saunders, 1938.
- Hinman, Frank: Principles and Practice of Urology. \$10. Saunders, 1935.
- Huhner, Max: Diagnosis and Treatment of Sexual Disorders in the Male and Female. Ed. 2. \$3.50. Davis, 1939.
- Keyes, Edward L., and Ferguson, Russell S.: Urology. Ed. 6. \$10. Appleton, 1936.
- Lowsley, O. S. (ed.): Oxford Urological Surgery. In 3 volumes. \$30. Oxford, 1932-1939.
- Pelouze, Percy S.: Gonorrhea in the Male and Female. Ed. 3. \$6. Saunders, 1939.
- Thomson-Walker, Sir John W.: Surgical Diseases and Injuries of the Genito-Urinary Organs. Ed. 2. \$10. Wood, 1936.
- Year Book of Urology. Ed. by John H. Cunningham. \$2.50. Year Bk. Pubs., 1939.

PUBLISHERS

- American Heart Association, Inc., 50 W. 50th St., New York.
- American Hospital Association, 18 E. Division St., Chicago.
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- National Medical Book Co., Inc., New York. (Out of business.)
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- Thomas Nelson & Sons, 385 Madison Ave., New York.
- Nervous and Mental Disease Publishing Co., 64 W. 56th St., New York.
- W. W. Norton & Co., Inc., 70 5th Ave., New York.
- Oxford University Press, 114 5th Ave., New York; Amen House, Warwick Sq., London, E. C. 4.
- Physicians Record Co., 161 W. Harrison St., Chicago.
- W. F. Prior Co., Inc., Hagerstown, Md.
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- W. B. Saunders Co., W. Washington Sq., Philadelphia.
- Stanford University Press, Stanford University, Calif.
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- Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore.
- Williams Wood & Co., Division of Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore.
- Year Book Publishers, Inc., 304 S. Dearborn St., Chicago.

HOSPITAL SERVICE ACCORDING TO AGENCIES CONCERNED AND
TYPES OF SERVICE

The people of America have usually built hospitals in response to need, whenever and wherever that need has been demonstrated. Evidently they provided hospital service in much the same way that they built roads, canals, bridges, schools and churches. The volume or capacity of facilities and the particular type or design have always been gaged by the need and by the funds or resources available for meeting that need.

Hospitals have, as a rule, been built by whatever agency was in best position to provide hospital facilities in a particular community, whether the agency happened to be public or private. Frequently the need of hospital facilities in a community has been met by some church centered organization or by some other type of nonprofit association, usually one operating specified hospital service in a given community. Fraternal organizations have also engaged in providing hospital facilities as part of the benefits to members. Hospitals have been provided as required by the federal government for Army, Navy, Public Health Service, Veterans Administration, Indian Service and possibly other departments. Hospital service has also been provided where occasion required by state governments, cities, counties or a combination of two government agencies, such as the city-county hospitals.

In addition to governmental agencies and nonprofit organizations, there have been proprietary organizations, such as individuals and partnerships, usually physicians who provide hospital facilities as a convenience in taking care of their own patients, or nurses who establish accommodations for patients as a livelihood. There are also corporations unrestricted as to profit evidently established with the dual purpose of caring for the sick and making a living through this enterprise.

Experience has taught society that each community needs a general hospital, and that it is also expedient in a general hospital to take care of sickness and injuries as they occur. Experience also has taught that cases such as mental and tuberculous, for obvious reasons, can better and more economically be cared for in hospitals designed for the particular type of case. In areas of dense population there are still further types of hospitals that have been found advantageous. Also there are special hospitals, such as children's, orthopedic, maternity, industrial, eye, ear, nose and throat, and cardiac. The task of mental hospitals has been subdivided, giving rise to special classifications such as mentally deficient, epileptic, drug and alcoholic and so on. In addition to those mentioned there are other classifications, some of which do not occur often.

We have provided in the following pages an analysis of the hospital service of each state according to the several agencies concerned, and the type of service by each.

† Figures for "average census" and "patients admitted" are exclusive of newborn infants.

ALABAMA							ARIZONA—Continued						
Governmental							Governmental						
	Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†		Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†
Federal General.....	5	2,383	2,068	2	41	9,723	State Nervous and mental.....	1	957	900	1	1	877
State Nervous and mental.....	3	6,276	6,150	..	6	1,937	State Tuberculosis.....	1	100	98	..	..	81
Hospital depts. of institutions....	3	190	100	..	..	3,633	State Total.....	2	1,057	998	1	1	961
Total.....	6	6,466	6,250	..	6	5,570	County General.....	6	465	326	43	500	5,652
County General.....	3	533	384	54	2,557	14,100	Nongovernmental						
Tuberculosis.....	6	286	191	..	..	584	Church General.....	6	733	452	90	1,946	17,632
Total.....	9	819	575	54	2,557	14,693	Church Tuberculosis.....	2	100	42	..	..	126
City General.....	2	106	59	16	272	2,491	Church Total.....	8	833	494	90	1,946	17,758
City-county General.....	2	203	131	30	665	4,907	Fraternal Tuberculosis.....	1	25	14	..	..	29
Nongovernmental							Nonprofit corporations and associations						
Church General.....	5	627	441	67	1,586	21,375	Nonprofit General.....	11	404	172	53	863	6,851
Maternity.....	2	77	47	32	333	471	Nonprofit Tuberculosis.....	2	117	78	..	..	129
Hospital depts. of institutions....	1	25	6	..	..	631	Nonprofit Total.....	13	521	250	53	863	6,981
Total.....	8	729	494	99	1,919	22,477	Individual and partnership General.....	2	48	28	9	53	558
Nonprofit corporations and associations General.....	15	1,156	670	132	2,634	30,597	Individual Nervous and mental.....	1	6	4	..	..	12
Tuberculosis.....	2	115	91	..	..	300	Individual Tuberculosis.....	4	89	55	..	..	120
Children's.....	1	50	30	..	..	1,144	Individual Convalescent and rest.....	1	28	19	..	..	26
Orthopedic.....	1	50	32	..	..	267	Individual Total.....	8	171	101	9	53	1,016
Hospital depts. of institutions....	1	18	1	1	1	104	Grand total.....	58	4,838	3,500	286	4,012	45,714
Total.....	20	1,389	804	133	2,635	32,412	ARKANSAS						
Individual and partnership General.....	30	1,051	445	135	1,568	10,988	Governmental						
Nervous and mental.....	1	50	24	..	..	418		Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†
Convalescent and rest.....	1	15	8	..	..	206	Federal General.....	2	670	627	3	13	5,122
Total.....	32	1,116	477	135	1,568	20,612	Federal Nervous and mental.....	1	1,255	1,154	..	..	577
Corporations (profit unrestricted) General.....	6	349	174	45	815	7,561	Federal All other hospitals.....	1	69	59	4	11	675
Grand total.....	90	13,560	11,032	514	10,418	120,479	Federal Total.....	4	2,055	1,829	7	24	6,475
ARIZONA							State General.....	1	220	82	20	163	2,551
	Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†	State Nervous and mental.....	1	4,227	4,173	..	11	1,676
Federal General.....	14	725	585	67	557	11,441	State Tuberculosis.....	1	784	724	..	..	1,676
Tuberculosis.....	6	1,041	679	67	2	2,472	State Hospital depts. of institutions....	1	121	1	..	..	81
Total.....	20	1,766	1,264	90	559	13,913	State Total.....	5	5,263	4,920	29	174	5,472
							County General.....	1	200	1-2	6	112	1,221
	Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†	City General.....	2	170	26	12	176	1,771
Federal General.....	14	725	585	67	557	11,441							
Tuberculosis.....	6	1,041	679	67	2	2,472		Hospitals	Beds	Average Census	Bassnets	Births	Patients Admitted†
Total.....	20	1,766	1,264	90	559	13,913							

ARKANSAS—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church General.....	10	1,071	600	125	2,341	22,700
Fraternal General.....	2	100	56	11	50	1,413
Nonprofit corporations and associations						
General.....	7	289	113	46	715	5,694
Maternity.....	1	34	1	14	24	34
Industrial.....	2	275	198	..	..	6,999
Children's.....	1	83	60	..	..	947
Total.....	11	681	362	60	739	13,674
Individual and partnership						
General.....	20	499	190	66	649	9,405
Eye, ear, nose and throat.....	1	8	3	..	..	500
Total.....	21	507	193	66	649	9,905
Corporations (profit unrestricted)						
General.....	4	123	29	21	114	2,308
Grand total.....	60	10,130	8,267	338	4,428	65,140

CALIFORNIA

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	15	5,698	4,657	33	341	39,598
Nervous and mental.....	1	1,149	1,101	..	..	319
Tuberculosis.....	2	699	547	..	..	893
Hospital depts. of institutions....	2	73	50	..	..	619
Total.....	20	7,619	6,355	33	341	41,432
State						
General.....	2	539	421	30	533	8,948
Nervous and mental.....	9	27,148	26,390	..	..	7,695
Hospital depts. of institutions....	3	389	258	..	..	4,370
Total.....	14	28,076	27,069	30	533	21,013
County						
General.....	39	12,039	9,708	588	14,870	167,828
Isolation.....	11	2,652	2,472	..	..	2,528
Hospital depts. of institutions....	1	121	68	..	..	4,381
Total.....	54	17,737	15,090	588	14,870	177,133
City						
General.....	1	34	19	14	260	1,128
Industrial.....	1	13	3	..	..	178
Total.....	2	47	22	14	260	1,306
City-county						
General.....	1	1,263	1,074	45	748	15,893
Tuberculosis.....	1	111	100	..	..	141
Hospital depts. of institutions....	1	770	753	..	..	1,663
Total.....	3	2,144	1,927	45	748	17,697
Nongovernmental						
Church						
General.....	37	5,029	3,517	829	19,662	137,168
Tuberculosis.....	2	140	143	..	..	164
Maternity.....	3	193	188	56	364	491
Convalescent and rest.....	1	15	10	..	..	165
Total.....	43	5,377	3,858	885	20,026	137,988
Fraternal						
General.....	1	210	176	10	220	3,720
Tuberculosis.....	1	60	30	..	..	21
Orthopedic.....	1	60	60	..	..	294
Total.....	3	330	266	10	220	4,035
Nonprofit corporations and associations						
General.....	46	4,233	2,829	767	14,378	117,746
Industrial.....	1	40	21	..	..	128
Children's.....	8	588	547	..	..	606
Total.....	55	273	185	115	2,277	2,613
Industrial.....	3	562	445	..	..	9,616
Children's.....	3	286	231	10	72	7,029
Total.....	7	75	69	..	..	2,178
Industrial.....	7	353	309	..	..	1,141
Children's.....	1	24	3	..	..	310
Total.....	75	6,434	4,639	892	16,727	141,397
Individual and partnership						
General.....	78	1,866	953	445	7,748	44,714
Tuberculosis.....	12	935	791	..	..	1,421
Industrial.....	8	332	219	..	..	376
Children's.....	2	84	22	41	757	762

CALIFORNIA—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Eye, ear, nose and throat.....	1	33	16	..	..	1,043
Convalescent and rest.....	2	52	34	..	..	300
Total.....	104	3,272	2,035	486	8,505	48,616
Corporations (profit unrestricted)						
General.....	26	1,528	965	313	6,506	41,083
Nervous and mental.....	6	446	251	1	..	1,693
Tuberculosis.....	5	425	301	..	..	720
Eye, ear, nose and throat.....	1	21	10	..	..	1,879
Convalescent and rest.....	2	47	23	..	..	232
Total.....	40	2,467	1,580	314	6,506	45,697
Grand total.....	358	73,503	62,841	3,297	68,736	636,134

COLORADO

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	4	1,313	981	13	106	7,600
Nervous and mental.....	1	805	675	..	..	192
Total.....	5	2,118	1,656	13	106	7,792
State						
General.....	1	245	137	20	549	3,763
Nervous and mental.....	4	4,791	4,513	..	1	1,639
Hospital depts. of institutions....	3	105	62	..	..	2,616
Total.....	8	5,141	4,712	20	550	8,038
County						
General.....	2	148	96	31	594	3,845
Hospital depts. of institutions....	1	66	50	..	..	233
Total.....	3	214	146	31	594	4,080
City-county						
General.....	1	521	323	51	569	7,763
Isolation.....	1	80	31	..	..	819
Total.....	2	601	359	51	569	8,582
Nongovernmental						
Church						
General.....	23	2,342	1,420	336	6,343	49,272
Tuberculosis.....	4	294	183	..	..	210
Maternity.....	1	36	29	20	85	127
Total.....	28	2,672	1,632	356	6,428	49,609
Fraternal						
Tuberculosis.....	2	171	90	..	..	118
Nonprofit corporations and associations						
General.....	12	754	450	84	735	9,672
Tuberculosis.....	7	960	658	..	..	546
Maternity.....	1	11	3	9	104	115
Industrial.....	2	46	25	..	..	592
Children's.....	1	200	126	..	..	3,589
Total.....	23	1,971	1,262	93	839	14,514
Individual and partnership						
General.....	20	307	138	75	898	6,954
Nervous and mental.....	1	150	130	..	..	295
Tuberculosis.....	1	50	30	..	..	28
Convalescent and rest.....	1	30	30	..	..	55
Total.....	23	537	328	75	898	7,332
Corporations (profit unrestricted)						
General.....	3	106	35	11	92	1,370
Nervous and mental.....	2	196	98	..	..	504
Total.....	5	302	133	11	92	1,874
Grand total.....	99	13,727	10,318	650	9,986	101,939

CONNECTICUT

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	1	305	296	..	..	1,913
State						
Nervous and mental.....	4	8,727	8,452	1	..	2,081
Tuberculosis.....	5	1,400	1,230	..	..	841
Hospital depts. of institutions....	5	250	161	6	59	2,920
Total.....	14	10,407	9,843	9	59	5,845

REGISTERED HOSPITALS

DISTRICT OF COLUMBIA—Continued

CONNECTICUT—Continued					
Governmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
City General.....	1	315	209	39	331
Isolation.....	1	221	81	2	1
Convalescent and rest.....	1	272	252	...	617
Total.....	4	808	542	41	949
Nongovernmental					
Church General.....	5	1,496	1,113	271	5,409
Maternity.....	1	9	3	6	72
Convalescent and rest.....	1	130	85	...	881
Total.....	7	1,635	1,201	277	6,362
Nonprofit corporations and associations					
General.....	28	4,213	3,004	735	14,698
Nervous and mental.....	1	270	268	...	593
Tuberculosis.....	2	207	189	...	416
Orthopedic.....	1	200	173	...	99
Convalescent and rest.....	1	30	20	...	42
Hospital depts. of institutions.....	4	173	125	...	1,717
Total.....	37	5,093	3,777	735	16,098
Individual and partnership					
General.....	2	35	17	...	2
Nervous and mental.....	4	218	105	...	290
Convalescent and rest.....	2	30	17	...	44
Total.....	8	283	139	...	1,130
Corporations (profit unrestricted)					
Nervous and mental.....	8	527	370	...	801
Convalescent and rest.....	2	55	33	...	209
Total.....	10	582	403	...	1,010
Grand total.....	81	19,113	10,111	1,062	20,572

Nongovernmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Nonprofit corporations and associations	10	1,663	1,321	236	6,177
General.....	6	1,126	915	201	5,571
Maternity.....	1	177	123	85	1,717
Children's.....	1	200	123	...	621
Convalescent and rest.....	1	160	155	...	5
Total.....	10	1,663	1,321	236	6,177
Individual and partnership					
Convalescent and rest.....	1	22	10	...	2
Grand total.....	28	14,687	12,883	636	12,972

FLORIDA

Governmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	6	1,059	723	...	1,794
State General.....	2	5,278	4,917	5	1,003
Nervous and mental.....	1	318	314	...	26
Tuberculosis.....	3	168	68	2	243
Hospital depts. of institutions.....	6	5,764	5,299	7	3,720
Total.....	7	823	603	65	1,790
County					
General.....	2	169	140	...	70
Tuberculosis.....	9	983	803	65	1,691
Total.....	7	1,153	678	106	2,381
City					
General.....	2	135	54	17	271
City-county General.....	2	90	70	...	191
Tuberculosis.....	4	225	120	17	271
Total.....	7	1,153	678	106	2,381

Nongovernmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Church General.....	7	780	456	135	2,605
Fraternal General.....	1	75	56	4	100
Orthopedic.....	1	75	39	...	64
Hospital depts. of institutions.....	1	25	16	...	...
Total.....	3	175	111	4	120
Nonprofit corporations and associations					
General.....	22	1,233	588	186	2,760
Nervous and mental.....	2	33	26	...	5
Tuberculosis.....	1	16	11	14	27
Maternity.....	1	40	17	...	131
Orthopedic.....	1	1,342	642	200	2,757
Total.....	26	1,342	642	200	2,757
Individual and partnership					
General.....	21	553	213	112	1,284
Nervous and mental.....	4	173	48	...	72
Convalescent and rest.....	1	30	11	...	12
Total.....	26	756	272	112	1,284
Corporations (profit unrestricted)					
General.....	4	125	60	26	340
Grand total.....	97	12,342	9,174	672	11,460

DELAWARE

Governmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	1	28	14	...	360
State General.....	1	86	68	4	33
Nervous and mental.....	2	1,741	1,598	1	3
Tuberculosis.....	2	200	171	...	134
Total.....	5	2,027	1,837	5	1,102
Nongovernmental					
Church General.....	1	104	52	31	315
Nonprofit corporations and associations	6	795	460	150	2,381
General.....	1	24	18	...	20
Tuberculosis.....	1	819	478	150	2,381
Total.....	7	819	478	150	2,381
Corporations (profit unrestricted)					
General.....	1	15	7	6	60
Grand total.....	15	2,893	2,388	192	2,792

DISTRICT OF COLUMBIA

Governmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	6	3,058	2,422	73	1,246
Nervous and mental.....	1	6,450	6,251	...	1,126
Hospital depts. of institutions.....	1	30	13	...	1,146
Total.....	8	9,538	8,686	73	2,392
City					
General.....	1	1,105	813	115	1,539
Nervous and mental.....	1	690	572	...	1
Tuberculosis.....	1	670	608	...	538
Hospital depts. of institutions.....	2	200	152	...	1,494
Total.....	5	2,575	2,145	115	1,840
Nongovernmental					
Church General.....	3	789	638	152	3,700
Eye, ear, nose and throat.....	1	100	63	...	15,545
Total.....	4	889	691	152	3,709

GEORGIA

Governmental					
Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	6	1,238	625	19	1,656
Nervous and mental.....	1	1,061	1,006	...	1,656
Hospital depts. of institutions.....	1	148	112	...	1,656
Total.....	8	2,347	2,123	19	3,312
State					
Nervous and mental.....	2	7,410	7,516	...	1,261
Tuberculosis.....	1	313	275	...	66
Hospital depts. of institutions.....	1	24	1	...	12
Total.....	4	7,747	7,792	...	2,229
County					
General.....	4	235	104	23	5,007
Tuberculosis.....	1	43	23	...	1,007
Total.....	5	278	127	23	6,014

GEORGIA—Continued

	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Governmental						
City						
General.....	5	1,100	822	158	5,345	35,263
All other hospitals.....	2	113	81	..	...	983
Total.....	7	1,213	903	158	5,345	36,249
City-county						
General.....	7	383	240	52	1,120	10,667
Tuberculosis.....	1	256	231	..	...	149
Total.....	8	639	471	52	1,120	10,814
Nongovernmental						
Church						
General.....	7	589	408	88	1,917	16,692
Fraternal						
Orthopedic.....	1	60	60	..	...	283
Nonprofit corporations and associations						
General.....	13	932	589	156	3,324	26,434
Maternity.....	1	26	25	12	55	71
Industrial.....	2	137	74	..	...	2,920
Children's.....	1	42	29	..	...	1,051
Orthopedic.....	1	112	71	..	...	230
Total.....	18	1,269	788	168	3,379	30,706
Individual and partnership						
General.....	40	971	462	137	2,017	23,816
Nervous and mental.....	2	190	141	..	...	632
Eye, ear, nose and throat.....	1	12	6	..	...	651
Total.....	43	1,173	609	137	2,017	25,099
Corporations (profit unrestricted)						
General.....	11	515	262	69	1,238	13,231
Grand total.....	112	16,025	13,553	719	15,579	157,246

IDAHO

	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Governmental						
Federal						
General.....	2	190	153	4	52	1,498
Tuberculosis.....	1	132	117	..	2	105
Total.....	3	322	270	4	54	1,603
State						
Nervous and mental.....	3	1,566	1,487	..	...	342
Hospital depts. in institutions.....	1	30	14	..	...	1,071
Total.....	4	1,596	1,501	..	...	1,413
County						
General.....	5	202	148	48	967	6,624
City-county						
General.....	2	72	26	18	332	1,643
Nongovernmental						
Church						
General.....	9	660	438	136	2,620	16,687
Maternity.....	1	32	21	17	233	261
Total.....	10	692	459	153	2,853	16,948
Nonprofit corporations and associations						
General.....	3	69	37	17	156	830
Individual and partnership						
General.....	16	403	176	76	882	7,782
Corporations (profit unrestricted)						
General.....	2	40	23	12	147	679
Grand total.....	45	3,396	2,610	328	5,391	37,812

ILLINOIS

	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Governmental						
Federal						
General.....	6	2,627	2,292	..	...	18,314
Nervous and mental.....	2	2,940	2,914	6	38	807
Total.....	8	5,567	5,206	6	38	19,221
State						
General.....	1	465	349	24	648	5,011
Nervous and mental.....	13	41,457	37,947	6	31	13,272
Eye, ear, nose and throat.....	1	200	153	..	...	5,505
Hospital depts. of institutions.....	6	453	136	..	...	8,090
Total.....	20	42,605	38,605	40	679	32,778

ILLINOIS—Continued.

	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Governmental						
County						
General.....	5	3,558	3,101	258	5,028	84,446
Tuberculosis.....	17	1,580	1,171	3	1	1,284
Hospital depts. of institutions.....	1	1,054	1,016	..	..	1,725
Total.....	23	6,192	5,288	261	5,029	87,455
City						
General.....	12	649	389	151	2,762	19,166
Tuberculosis.....	4	1,684	1,621	1	4	2,214
Isolation.....	3	459	241	..	...	4,059
Convalescent and rest.....	1	270	211	..	...	1,107
Hospital depts. of institutions.....	1	75	30	..	...	1,130
Total.....	21	3,167	2,492	152	2,766	27,670
Nongovernmental						
Church						
General.....	81	11,156	7,057	1,792	36,224	266,463
Nervous and mental.....	1	150	123	..	...	236
Maternity.....	4	195	161	161	2,916	3,261
Orthopedic.....	1	300	293	..	...	459
Convalescent and rest.....	1	75	42	..	...	783
Total.....	88	11,876	7,616	1,953	39,140	271,232
Fraternal						
General.....	1	159	105	25	440	3,831
".....	1	60	60	..	...	246
".....	2	120	73	..	...	2,050
Total.....	4	339	238	25	440	6,127
Nonprofit corporations and associations						
General.....	69	7,595	4,950	1,507	27,769	201,252
Nervous and mental.....	2	100	48	..	...	553
Tuberculosis.....	4	310	247	..	...	536
Industrial.....	2	89	48	2	...	1,188
Children.....	1	252	164	..	...	3,785
Orthopedic.....	1	120	66	..	...	147
Convalescent and rest.....	4	363	237	..	...	583
Hospital depts. of institutions.....	2	57	39	..	...	321
All other hospitals.....	1	100	59	..	...	111
Total.....	86	8,986	5,958	1,509	27,769	208,478
Individual and partnership						
General.....	22	457	199	98	958	7,970
Nervous and mental.....	2	293	196	..	...	584
Maternity.....	1	10	3	10	40	396
Convalescent and rest.....	2	57	52	..	...	113
Total.....	34	817	450	108	998	8,973
Corporations (profit unrestricted)						
General.....	9	758	389	138	1,815	17,640
Nervous and mental.....	4	240	167	..	...	211
Tuberculosis.....	2	208	100	..	...	217
Eye, ear, nose and throat.....	1	75	11	..	...	1,285
Convalescent and rest.....	1	75	37	..	...	104
Total.....	17	1,356	794	138	1,815	19,457
Grand total.....	301	81,105	66,667	4,192	78,674	681,397

INDIANA

	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Governmental						
Federal						
General.....	3	438	337	4	33	5,028
Nervous and mental.....	1	1,509	1,535	..	...	259
Total.....	4	1,947	1,872	4	33	5,287
State						
General.....	1	566	446	38	1,104	9,796
Nervous and mental.....	9	12,516	12,180	..	...	2,909
Tuberculosis.....	1	250	187	..	...	297
Hospital depts. of institutions.....	6	429	227	..	...	7,672
Total.....	17	13,761	13,040	38	1,104	20,663
County						
General.....	23	984	593	188	3,525	24,492
Tuberculosis.....	9	1,325	1,076	..	1	1,634
Total.....	32	2,309	1,669	188	3,526	26,146
City						
General.....	4	748	563	62	1,164	13,381
Nongovernmental						
Church						
General.....	26	3,861	2,566	667	14,949	105,515
Nervous and mental.....	1	32	30	..	...	153
Convalescent and rest.....	1	175	85	..	...	700
Total.....	30	4,068	2,681	667	14,949	106,368

INDIANA—Continued

Nongovernmental	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Fraternal						
Hospital depts. of institutions....	1	82	65	..	...	80
Nonprofit corporations and associations						
General.....	16	1,201	766	208	4,369	31,214
Maternity.....	1	22	10	20	37	43
Industrial.....	1	50	29	..	...	483
Hospital depts. of institutions....	1	12	4	..	...	220
All other hospitals.....	1	6	4	..	...	228
Total.....	20	1,291	813	228	4,406	32,183
Individual and partnership						
General.....	12	234	111	69	740	5,030
Maternity.....	1	12	2	10	196	215
Eye, ear, nose and throat.....	1	7	1	..	...	348
Convalescent and rest.....	1	23	11	..	...	60
All other hospitals.....	1	15	10	..	...	353
Total.....	16	291	135	79	936	6,006
Corporations (profit unrestricted)						
General.....	2	161	104	24	183	3,839
Nervous and mental.....	2	80	37	..	...	261
Convalescent and rest.....	4	391	134	..	...	2,446
Total.....	8	632	275	24	183	6,546
Grand total.....	132	23,129	21,113	1,290	26,301	216,683

IOWA

Governmental	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal						
General.....	3	452	395	7	69	4,816
Nervous and mental.....	1	1,015	1,016	..	...	238
Total.....	4	1,467	1,411	7	69	5,054
State						
General.....	1	900	693	54	1,590	19,176
Nervous and mental.....	7	10,243	9,857	..	1	2,713
Tuberculosis.....	1	422	410	..	...	251
Hospital depts. of institutions....	8	546	319	..	8	7,179
Total.....	17	12,111	11,279	54	1,599	29,319
County						
General.....	6	269	213	52	1,195	9,301
Nervous and mental.....	1	72	70	..	...	9
Tuberculosis.....	4	331	293	..	...	345
Isolation.....	1	49	14	..	...	478
Total.....	12	721	593	52	1,195	10,133
City						
General.....	8	248	140	61	934	5,811
Nongovernmental						
Church						
General.....	38	3,515	2,195	577	11,729	67,122
Nervous and mental.....	2	380	341	..	...	763
Maternity.....	1	50	34	30	112	117
Total.....	41	3,945	2,573	607	11,841	88,005
Fraternal						
Convalescent and rest.....	1	55	44	..	...	12
Nonprofit corporations and associations						
General.....	20	1,018	559	188	3,323	23,597
Maternity.....	2	90	44	50	64	97
Industrial.....	1	40	11	..	...	320
Convalescent and rest.....	1	20	18	..	...	101
Hospital depts. of institutions....	1	34	7	..	...	292
Total.....	25	1,202	669	218	3,397	24,426
Individual and partnership						
General.....	24	535	240	125	1,266	10,279
Nervous and mental.....	1	52	50	..	...	9
Maternity.....	1	5	1	4	45	47
Total.....	26	592	291	129	1,311	10,335
Corporations (profit unrestricted)						
General.....	6	217	111	58	550	4,370
Nervous and mental.....	1	50	26	..	...	130
Total.....	7	267	147	58	550	4,500
Grand total.....	151	29,648	17,143	1,169	29,957	177,375

KANSAS

Governmental	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal						
General.....	4	1,295	984	18	142	10,571
Hospital depts. of institutions....	2	392	251	..	...	475
Total.....	7	1,687	1,235	18	142	15,129
State						
General.....	1	325	231	25	439	5,532
Nervous and mental.....	5	7,222	6,853	1	1	1,115
Tuberculosis.....	1	510	398	..	...	75
Hospital depts. of institutions....	6	259	94	..	2	3,412
Total.....	13	8,316	7,488	26	442	11,111
County						
General.....	5	227	126	40	495	4,746
Tuberculosis.....	1	60	45	..	...	69
Total.....	6	287	171	40	495	4,815
City						
General.....	8	250	115	49	710	5,121
City-county						
Tuberculosis.....	1	70	50	..	...	15
Nongovernmental						
Church						
General.....	38	3,057	1,920	468	7,508	65,411
Maternity.....	1	73	39	19	55	59
Total.....	39	3,130	1,959	487	7,563	65,470
Nonprofit corporations and associations						
General.....	21	581	251	123	2,240	13,279
Maternity.....	1	20	12	12	20	25
Industrial.....	3	240	137	..	...	2,509
Total.....	25	841	430	150	2,270	16,117
Individual and partnership						
General.....	15	223	115	50	622	4,066
Nervous and mental.....	2	67	24	..	...	201
Total.....	17	290	139	50	622	4,267
Corporations (profit unrestricted)						
General.....	3	113	61	18	221	2,199
Nervous and mental.....	1	60	46	..	...	107
Total.....	4	173	107	18	221	2,306
Grand total.....	120	15,044	11,694	838	12,778	125,521

KENTUCKY

Governmental	Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal						
General.....	4	453	251	13	85	5,114
Nervous and mental.....	2	1,559	1,548	..	...	1,724
Tuberculosis.....	1	375	353	..	...	1,222
Total.....	7	2,387	2,152	13	85	8,060
State						
Nervous and mental.....	4	7,214	7,014	1	2	1,581
Tuberculosis.....	1	130	107	12	..	253
Eye, ear, nose and throat.....	1	38	21	..	...	26
Hospital depts. of institutions....	1	65	41	..	...	1,251
Total.....	7	7,477	7,183	3	2	2,851
County						
General.....	1	110	62	15	242	2,539
Tuberculosis.....	2	111	107	..	...	173
Total.....	3	221	169	15	242	2,712
City						
General.....	4	703	452	87	1,573	15,522
City-county						
General.....	3	113	83	22	425	2,611
Tuberculosis.....	1	529	479	..	...	500
Total.....	4	632	532	22	425	4,600
Nongovernmental						
Church						
General.....	11	1,652	1,222	276	4,753	41,777
Maternity.....	1	45	25	19	51	107
Total.....	12	1,725	1,277	295	4,804	41,884
Fraternal						
Orthopedic.....	1	24	20	..	...	44

KENTUCKY—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Nonprofit corporations and associations	27	1,496	730	191	2,141	27,823
General.....	1	95	31	1	1	1,830
Industrial.....	1	75	48	..	..	1,153
Children's.....	1	100	77	..	..	687
Orthopedic.....	1	96	92	..	..	25
Convalescent and rest.....	1	..	..	..	..	..
Total.....	31	1,862	978	192	2,142	31,518
Individual and partnership	9	205	87	33	304	4,371
General.....	4	142	76	..	..	420
Nervous and mental.....	..	..	..	..	..	..
Total.....	13	347	163	33	304	4,791
Corporations (profit unrestricted)	11	301	193	46	409	9,737
General.....	2	45	30	..	..	375
Nervous and mental.....	..	..	..	..	..	..
Total.....	13	436	223	46	409	10,112
Grand total.....	95	15,815	13,199	634	10,148	125,004

LOUISIANA

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	3	1,329	1,038	5	53	9,970
General.....	1	454	356	..	..	74
All other hospitals.....	..	..	..	..	..	..
Total.....	4	1,783	1,394	5	53	10,044
State	4	4,391	3,079	195	7,304	97,936
General.....	3	7,157	6,446	..	3	1,507
Nervous and mental.....	1	115	101	..	..	79
Tuberculosis.....	1	21	12	..	2	287
Hospital depts. of institutions....	..	..	..	..	..	..
Total.....	9	11,684	9,638	195	7,309	99,803
City	1	100	52	..	..	629
Nervous and mental.....	..	..	..	..	..	..
Total.....	10	1,507	1,083	150	3,874	41,925
Church	9	1,217	808	150	3,874	41,920
General.....	1	350	275	..	..	405
Nervous and mental.....	..	..	..	..	..	..
Total.....	10	1,507	1,083	150	3,874	41,925
Fraternai	1	63	27	12	140	1,343
General.....	1	60	60	..	..	194
Orthopedic.....	..	..	..	..	..	..
Total.....	2	123	87	12	140	1,537
Nonprofit corporations and associations	10	806	516	106	2,700	22,275
General.....	4	277	161	..	..	322
Tuberculosis.....	2	281	26	2	..	867
Industrial.....	1	78	36	..	..	3,622
Eye, ear, nose and throat.....	1	30	20	..	..	238
Convalescent and rest.....	..	..	..	..	..	..
Total.....	18	1,472	759	108	2,700	27,324
Individual and partnership	18	362	142	59	1,096	8,679
General.....	1	64	17	..	..	184
Nervous and mental.....	1	18	10	..	..	10
Tuberculosis.....	..	..	..	..	..	..
Total.....	20	444	169	59	1,096	8,873
Corporations (profit unrestricted)	8	439	260	57	1,195	13,356
General.....	..	..	..	..	..	..
Total.....	72	17,612	13,442	586	10,427	203,497

MAINE

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	4	430	333	..	4	3,663
General.....	..	..	..	..	..	..
State	3	3,864	3,819	..	3	637
Nervous and mental.....	2	482	457	..	..	529
Tuberculosis.....	..	..	..	..	..	..
Total.....	6	4,346	4,276	..	3	1,186
City	3	236	131	29	229	2,729
General.....	..	..	..	..	..	..
Total.....	9	4,582	4,407	29	231	3,915
Church	5	367	276	48	684	9,435
General.....	..	..	..	..	..	..
Nonprofit corporations and associations	24	1,463	1,060	253	3,753	32,325
General.....	1	30	19	..	..	24
Industrial.....	1	100	79	..	..	572
Orthopedic.....	..	..	..	..	..	..
Convalescent and rest.....	..	..	..	..	..	..
Total.....	26	1,593	1,158	253	3,753	32,934

MAINE—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Individual and partnership	7	154	69	32	206	2,327
General.....	1	18	9	..	..	123
Nervous and mental.....	1	14	10	12	71	409
Maternity.....	1	14	6	..	..	27
Convalescent and rest.....	..	..	..	..	..	..
Total.....	10	200	94	44	277	2,886
Corporations (profit unrestricted)	6	227	150	46	588	5,422
General.....	1	30	9	..	..	13
Nervous and mental.....	1	50	20	..	..	20
Convalescent and rest.....	..	..	..	..	..	..
Total.....	8	307	179	46	588	5,455
Grand total.....	62	7,479	6,447	422	5,538	58,288

MARYLAND

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	6	906	577	6	27	9,823
General.....	1	1,390	1,325	..	..	377
Nervous and mental.....	..	..	..	..	..	..
Total.....	7	2,296	1,902	6	27	10,205
State	2	439	369	60	1,302	10,014
General.....	5	7,964	7,753	..	..	1,950
Nervous and mental.....	4	1,157	1,021	..	..	1,164
Tuberculosis.....	2	97	43	..	..	1,023
Hospital depts. of institutions....	..	..	..	..	..	..
Total.....	13	9,637	9,191	60	1,302	14,151
County	3	110	61	20	301	1,291
General.....	..	..	..	..	..	..
City	1	1,255	1,073	60	2,168	8,831
General.....	1	110	52	..	..	1,218
Isolation.....	1	24	9	..	..	450
Hospital depts. of institutions....	..	..	..	..	..	..
Total.....	3	1,419	1,134	60	2,168	10,499
City-county	1	160	126	26	400	3,911
General.....	..	..	..	..	..	..
Total.....	1	160	126	26	400	3,911
Church	7	1,409	1,078	186	3,587	32,353
General.....	1	600	588	..	..	123
Nervous and mental.....	1	40	8	..	..	1,890
Eye, ear, nose and throat.....	..	..	..	..	..	..
Total.....	9	2,049	1,674	186	3,587	34,366
Nonprofit corporations and associations	20	2,922	2,057	380	6,552	59,133
General.....	1	285	285	..	..	365
Nervous and mental.....	2	260	251	5	..	294
Tuberculosis.....	1	24	1	..	..	50
Industrial.....	1	60	39	..	..	2,511
Eye, ear, nose and throat.....	2	247	165	..	..	478
Orthopedic.....	3	237	201	..	..	329
Convalescent and rest.....	..	..	..	..	..	..
Total.....	30	4,035	2,909	385	6,552	63,160
Individual and partnership	3	58	30	9	88	1,016
General.....	7	310	236	..	..	803
Nervous and mental.....	1	23	19	..	..	78
Convalescent and rest.....	..	..	..	..	..	..
Total.....	11	391	285	9	88	1,897
Corporations (profit unrestricted)	2	215	105	40	638	3,702
General.....	1	20	14	..	..	72
Nervous and mental.....	..	..	..	..	..	..
Total.....	3	235	119	40	638	3,774
Grand total.....	80	20,352	17,491	792	15,063	143,254

MASSACHUSETTS

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	6	1,210	959	9	59	9,478
General.....	2	1,939	1,838	..	..	332
Nervous and mental.....	..	..	..	..	..	..
Total.....	8	3,149	2,817	9	59	9,810
State	2	3,473	3,076	40	93	5,527
General.....	17	29,363	25,105	10	15	8,199
Nervous and mental.....	4	1,203	920	..	..	1,474
Tuberculosis.....	1	300	256	..	..	272
Orthopedic.....	3	151	40	..	..	804
Hospital depts. of institutions....	1	147	123	..	..	1,578
All other hospitals.....	..	..	..	..	..	..
Total.....	28	34,642	32,325	59	108	17,905

MASSACHUSETTS—Continued

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County							
Tuberculosis.....	8	1,394	1,251	..	...	1,292	
City							
General.....	15	4,771	3,166	387	7,886	84,519	
Tuberculosis.....	4	1,046	759	1	4	1,365	
Isolation.....	8	460	155	4	2	1,120	
Hospital depts. of institutions....	2	200	182	..	...	614	
Total.....	29	6,477	4,262	392	7,892	87,618	
City-county							
Hospital depts. of institutions....	1	25	12	..	...	300	
Nongovernmental							
Church							
General.....	13	2,287	1,602	353	6,133	53,384	
Maternity.....	2	125	110	77	691	867	
Convalescent and rest.....	1	215	211	..	...	340	
Total.....	16	2,627	2,013	430	6,734	54,581	
Fraternal							
Orthopedic.....	1	60	61	..	...	383	
Nonprofit corporations and associations							
General.....	83	8,940	6,229	1,580	26,837	203,581	
Nervous and mental.....	4	338	267	..	...	1,019	
Tuberculosis.....	8	385	279	..	...	496	
Maternity.....	4	265	194	266	4,091	4,942	
Eye, ear, nose and throat.....	1	231	145	..	...	7,376	
Children's.....	6	585	404	..	...	7,917	
Orthopedic.....	2	180	132	..	...	35	
Convalescent and rest.....	4	289	254	..	...	719	
Hospital depts. of institutions....	4	135	45	6	...	2,347	
All other hospitals.....	3	206	169	..	...	3,155	
Total.....	110	11,554	8,118	1,852	30,928	231,587	
Individual and partnership							
General.....	11	294	140	71	854	4,934	
Nervous and mental.....	7	156	89	..	...	469	
Maternity.....	1	10	9	10	196	195	
Convalescent and rest.....	3	63	26	..	...	143	
Total.....	22	522	273	81	1,050	5,741	
Corporations (profit unrestricted)							
General.....	13	740	422	184	2,850	15,234	
Nervous and mental.....	2	160	132	..	...	480	
Convalescent and rest.....	2	51	35	..	...	101	
Total.....	17	951	589	184	2,850	15,815	
Grand total.....	249	61,401	51,921	2,098	49,021	425,032	

MICHIGAN

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal							
General.....	5	823	577	4	34	5,650	
Nervous and mental.....	1	1,010	1,038	..	...	332	
Total.....	6	1,833	1,615	4	34	5,972	
State							
General.....	2	1,455	1,185	40	964	25,885	
Nervous and mental.....	10	17,459	17,487	7	7	3,983	
Tuberculosis.....	3	962	756	2	5	616	
Children's.....	1	26	20	..	...	644	
Hospital depts. of institutions....	5	546	271	..	...	6,312	
Total.....	21	20,448	19,670	58	976	37,440	
County							
General.....	9	5,729	4,493	53	834	19,471	
Nervous and mental.....	3	4,550	4,281	..	...	1,146	
Tuberculosis.....	11	1,054	924	..	2	1,533	
Isolation.....	3	239	115	..	1	1,283	
Hospital depts. of institutions....	2	490	400	..	...	937	
Total.....	28	12,032	10,213	53	837	24,299	
City							
General.....	30	3,678	2,808	400	8,891	73,116	
Tuberculosis.....	1	843	791	..	...	613	
Isolation.....	2	46	19	..	...	299	
Total.....	33	4,567	3,618	400	8,891	74,028	
City-county							
Tuberculosis.....	1	145	121	..	...	123	
Isolation.....	1	42	21	..	...	437	
Total.....	2	187	142	..	...	560	

MICHIGAN—Continued

Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Church							
General.....	29	3,781	2,535	754	16,889	17,119	
Nervous and mental.....	2	390	330	..	...	1,119	
Maternity.....	1	140	83	16	412	1,119	
Convalescent and rest.....	1	25	15	..	...	1,119	
Total.....	34	4,336	2,963	770	18,221	19,457	
Fraternal							
Tuberculosis.....	1	125	112	..	...	1,119	
Hospital depts. of institutions....	1	45	28	..	...	1,119	
Total.....	2	170	140	..	...	1,119	
Nonprofit corporations and associations							
General.....	54	5,500	3,455	974	21,222	18,719	
Nervous and mental.....	1	270	239	..	...	1,119	
Tuberculosis.....	6	515	435	..	...	1,119	
Maternity.....	1	25	17	12	39	1,119	
Industrial.....	2	62	26	..	...	1,119	
Children's.....	1	239	196	..	...	1,119	
Orthopedic.....	1	50	37	..	...	1,119	
Convalescent and rest.....	1	200	115	..	...	1,119	
Total.....	67	6,861	4,540	986	21,261	18,719	
Individual and partnership							
General.....	31	664	360	134	1,265	1,154	
Tuberculosis.....	2	118	115	..	...	1,119	
Convalescent and rest.....	1	45	20	..	...	1,119	
Total.....	34	827	495	134	1,265	1,154	
Corporations (profit unrestricted)							
General.....	1	15	7	5	97	1,119	
Nervous and mental.....	2	60	41	..	...	1,119	
Tuberculosis.....	2	223	207	..	...	1,119	
All other hospitals.....	1	33	14	..	...	1,119	
Total.....	6	331	269	5	97	1,119	
Grand total.....	233	51,592	43,694	2,410	50,889	409,940	

MINNESOTA

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal							
General.....	7	946	813	31	359	8,723	
Nervous and mental.....	1	1,046	993	..	...	2,119	
Total.....	8	1,992	1,806	31	359	8,723	
State							
General.....	1	475	368	25	429	8,723	
Nervous and mental.....	9	14,491	13,534	21	32	2,119	
Tuberculosis.....	1	480	400	..	...	1,119	
Orthopedic.....	1	250	220	..	...	1,119	
Hospital depts. of institutions....	6	266	169	5	11	4,555	
Total.....	18	15,962	14,691	51	635	15,429	
County							
General.....	2	111	75	15	317	2,119	
Tuberculosis.....	13	1,511	1,349	6	2	1,119	
Hospital depts. of institutions....	1	65	64	..	...	1,119	
Total.....	16	1,687	1,488	21	319	3,357	
City							
General.....	11	981	648	137	2,423	15,429	
Isolation.....	2	44	5	..	...	1,119	
Convalescent and rest.....	2	215	191	..	...	1,119	
Total.....	15	1,240	844	137	2,423	15,429	
City-county							
General.....	3	973	694	72	1,422	12,017	
Tuberculosis.....	1	80	72	..	...	1,119	
Total.....	4	1,018	766	72	1,422	12,017	
Nongovernmental							
Church							
General.....	37	3,696	2,662	553	11,276	91,417	
Maternity.....	1	75	49	11	122	1,119	
Total.....	38	3,741	2,711	564	11,398	91,417	
Fraternal							
Orthopedic.....	1	60	61	..	...	1,119	
Nonprofit corporations and associations							
General.....	29	2,445	1,672	421	8,509	71,119	
Nervous and mental.....	1	46	31	..	...	1,119	
Maternity.....	2	86	69	73	264	1,119	
Children's.....	1	65	59	..	...	1,119	
Convalescent and rest.....	2	126	106	..	...	1,119	
Total.....	46	2,768	1,938	479	9,277	71,119	

MINNESOTA—Continued

Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Individual and partnership							
General.....	56	947	428	251	2,948	18,286	
Nervous and mental.....	4	66	52	..	...	215
Total.....	60	1,013	480	251	2,948	18,471	
Corporations (profit unrestricted)							
General.....	11	627	416	56	611	14,818	
Eye, ear, nose and throat.....	1	188	133	..	...	7,932
Convalescent and rest.....	1	75	42	..	...	1,076
Total.....	13	890	591	56	611	23,826	
Grand total.....	219	30,371	25,346	1,684	29,723	273,213	

MISSISSIPPI

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal							
General.....	2	235	210	7	43	2,480	
Nervous and mental.....	1	788	794	..	...	526
Total.....	3	1,023	1,004	7	43	3,006	
State							
General.....	5	347	261	40	966	10,376	
Nervous and mental.....	3	4,750	4,286	..	15	2,261	
Tuberculosis.....	1	425	281	..	1	414	
Hospital depts. of institutions....	3	134	36	..	...	597
Total.....	12	5,656	4,864	40	982	13,651	
County							
General.....	3	76	30	8	147	1,629	
Tuberculosis.....	2	50	47	..	...	57
Total.....	5	126	77	8	147	1,686	
City							
General... ..	2	40	16	6	67	794	
City-county							
General.....	2	79	36	10	174	1,900	
Nongovernmental							
Church							
General.....	2	230	135	32	699	7,342	
Nonprofit corporations and associations							
General.....	30	1,116	564	160	2,184	28,757	
Tuberculosis.....	1	45	20	..	...	26
Total.....	31	1,161	584	160	2,184	28,783	
Individual and partnership							
General.....	35	931	420	136	1,633	19,951	
Nervous and mental.....	2	48	20	..	...	361
Total.....	37	979	440	136	1,633	20,312	
Corporations (profit unrestricted)							
General.....	3	112	50	14	183	2,561	
Grand total.....	97	9,406	7,206	413	6,132	80,035	

MISSOURI

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal							
General.....	4	988	780	6	28	7,308	
Nervous and mental.....	1	696	609	..	...	554
Total.....	5	1,684	1,389	6	28	8,062	
State							
General.....	1	150	66	10	63	3,398	
Nervous and mental.....	5	10,849	9,889	1	1	2,650	
Tuberculosis.....	1	725	686	..	1	848	
Eye, ear, nose and throat.....	1	65	28	..	...	312
Hospital depts. of institutions....	3	304	125	..	...	1,861
Total.....	11	12,093	10,794	11	65	9,078	
County							
General.....	3	277	188	50	649	6,223	
Tuberculosis.....	1	115	81	..	...	152
Total.....	4	392	269	50	649	6,375	
City							
General.....	10	2,625	1,973	210	5,310	49,790	
".....	2	4,090	4,032	6	1	527	
".....	2	807	717	..	1	532	
".....	1	200	121	..	1	1,233	
".....	1	95	85	..	...	230
Total.....	16	7,817	6,928	216	5,313	52,382	

MISSOURI—Continued

Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church							
General.....	33	4,991	3,426	649	12,247	113,311	
Nervous and mental.....	3	521	460	..	...	153
Tuberculosis.....	1	135	125	..	...	201
Maternity.....	3	197	81	85	938	1,160	
Convalescent and rest.....	1	40	40	..	...	82
Total.....	41	5,884	4,132	734	13,185	114,907	
Fraternal							
Orthopedic.....	1	100	101	..	...	447
Hospital depts. of institutions....	2	208	127	..	...	925
Total.....	3	308	228	..	...	1,372
Nonprofit corporations and associations							
General.....	17	1,267	788	197	2,699	28,531	
Nervous and mental.....	1	44	28	..	...	288
Tuberculosis.....	1	108	65	..	...	69
Maternity.....	3	175	112	112	1,915	2,287	
Industrial.....	3	435	179	..	...	5,348
Children's.....	3	420	315	..	...	6,387
Orthopedic.....	1	60	31	..	...	217
All other hospitals.....	1	44	39	..	...	986
Total.....	30	2,553	1,557	309	4,615	44,113	
Individual and partnership							
General.....	22	575	265	99	834	9,964	
Nervous and mental.....	3	80	39	..	...	305
Maternity.....	1	75	30	75	129	148	
Convalescent and rest.....	1	25	15	..	...	40
Total.....	27	735	349	174	963	10,457	
Corporations (profit unrestricted)							
General.....	4	134	66	20	158	2,492	
Nervous and mental.....	3	113	67	..	...	129
Maternity.....	1	50	36	24	135	160	
Total.....	8	297	169	44	293	2,781	
Grand total.	145	31,783	25,815	1,544	23,101	249,527	

MONTANA

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	8	415	297	31	435	6,742
State	Nervous and mental.....	1	1,998	1,902	13	1	522
	Tuberculosis.....	1	215	211	..	...	171
	Total.....	2	2,213	2,113	13	1	693
County	General.....	6	279	221	28	291	2,298
City-county	Isolation.....	1	25	4	..	...	68
Nongovernmental							
Church	General.....	23	1,831	1,103	322	4,947	35,468
Nonprofit corporations and associations							
	General.....	4	159	97	30	438	3,591
	Maternity.....	1	19	5	6	48	64
	Industrial.....	1	76	44	..	...	1,586
	Orthopedic.....	1	20	14	..	...	109
	Total.....	7	274	160	36	506	5,350
Individual and partnership	General.....	9	174	75	47	412	3,489
Corporations (profit unrestricted)							
	General.....	3	172	81	20	390	3,473
Grand total.....		59	5,383	4,054	497	6,082	57,581

NEBRASKA

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal							
General.....	4	371	263	9	84	3,359	
State							
General.....	1	210	167	20	451	3,479	
Nervous and mental.....	4	5,373	5,327	..	2	568	
Tuberculosis.....	1	161	154	..	...	156
Maternity.....	1	55	28	11	41	42	
Orthopedic.....	1	110	85	..	...	767
Hospital depts. of institutions....	1	18	11	..	...	481
Total.....	9	5,927	5,772	31	524	5,758	

REGISTERED HOSPITALS

NEW JERSEY

NEBRASKA—Continued

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County General	1	400	314	12	53	2,203	
City General	3	188	114	33	579	3,979	
Isolation	1	40	..	..	..	80	
Total	4	228	118	33	579	4,050	
Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Church General	26	2,263	1,332	343	6,354	51,133	
Nervous and mental	1	150	144	18	109	21	
Maternity	1	71	42	..	..	116	
Total	28	2,484	1,518	361	6,463	51,270	
Nonprofit corporations and associations	6	220	115	39	610	5,692	
General	1	679	276	182	1,712	12,080	
Individual and partnership	43	679	276	182	1,712	1,152	
General	3	160	122	18	191	1,152	
Corporations (profit unrestricted)	3	160	122	18	191	1,152	
General	98	10,469	8,498	685	10,218	85,578	
Grand total							

NEVADA

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General	5	145	82	12	74	1,693	
State Nervous and mental	1	375	346	..	..	..	77
County General	6	378	238	39	398	4,956	
Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Church General	1	75	61	15	240	1,894	
Nonprofit corporations and associations	2	60	29	10	123	700	
General	1	35	24	11	121	1,076	
Corporations (profit unrestricted)	16	1,068	780	87	1,136	10,398	
General							
Grand total							

NEW HAMPSHIRE

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General	1	150	36	..	..	..	453
State Nervous and mental	12	2,891	2,793	..	..	..	713
Tuberculosis	1	140	108	..	..	..	66
Total	3	3,031	2,901	..	..	..	779
Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County General	4	243	199	23	296	3,207	
Hospital depts. of institutions	1	67	51	..	..	137	
Total	5	310	250	23	296	3,441	
City General	1	69	50	15	242	1,762	
Isolation	1	67	10	..	..	184	
Total	2	136	69	15	242	1,886	
Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Church General	4	229	223	44	650	7,796	
Maternity	1	22	10	19	257	792	
Total	5	351	233	63	937	8,098	
Nonprofit corporations and associations	24	1,351	801	267	3,568	27,413	
General	1	12	59	..	..	916	
Convalescent and rest	1	33	12	..	..	25,223	
Hospital depts. of institutions	26	1,459	832	267	3,568	25,223	
Total	1	89	70	25	301	2,273	
Corporations (profit unrestricted)	1	106	76	..	..	2,263	
General	2	186	149	25	301	45,251	
Tuberculosis	44	5,623	4,489	393	5,641	45,251	
Total							
Grand total							

Governmental

Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
4	240	94	10	31	45
1	1,392	1,084	..	..	..
5	1,632	1,178	10	31	42
Federal General	..	..	..	..	..
Nervous and mental	..	..	..	..	..
Total	1	494	452	..	..
State Tuberculosis	8	16,101	15,700	1	6
Nervous and mental	7	355	101	3	30
Hospital depts. of institutions	16	16,950	16,343	4	26
Total	3	533	502	..	..
County General	6	5,961	5,652	..	..
Nervous and mental	10	2,305	2,207	..	..
Tuberculosis	1	272	200	284	5,332
Maternity	3	1,216	635	..	..
Isolation	23	10,347	9,096	284	5,333
Total	3	1,679	1,505	57	2,112
City General	5	656	309	..	..
Isolation	1	155	140	..	..
Convalescent and rest	1	98	88	..	..
Hospital depts. of institutions	10	2,588	2,042	57	2,112
Total	16	3,314	2,253	435	9,122

Nongovernmental

Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
16	3,314	2,253	435	9,122	702
1	8	6	7	50	..
1	15	9	..	..	..
18	3,337	2,268	442	9,172	76
Total	1	100	45	..	..
Fraternal Orthopedic	59	7,307	5,412	1,415	27,748
Nonprofit corporations and associations	2	725	681	..	..
General	2	317	237	..	..
Nervous and mental	1	58	33	..	..
Tuberculosis	1	65	37	..	..
Maternity	1	60	323	..	..
Eye, ear, nose and throat	5	602	29	..	..
Children's	1	40	22	..	..
Orthopedic	2	66	..	..	..
Convalescent and rest	74	9,240	6,794	1,430	27,788
Hospital depts. of institutions	4	76	37	21	192
Total	3	67	37	..	..
Individual and partnership	2	74	61	..	..
General	2	35	28	..	..
Nervous and mental	11	232	163	21	192
Tuberculosis	1	90	31	..	..
Convalescent and rest	5	220	163	..	..
Corporations (profit unrestricted)	2	103	58	..	..
General	1	30	12	..	..
Nervous and mental	9	448	264	2	4
Tuberculosis	167	44,894	33,193	2,250	41,703
Convalescent and rest					33,736
Total					
Grand total					

NEW MEXICO

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General	13	1,033	705	51	210	11,214	
Tuberculosis	15	1,370	958	51	210	11,214	
Total	1	76	9	5	..	..
State General	12	976	935	..	..	..
Nervous and mental	1	71	..	..	..	..
Tuberculosis	1	125	..	..	..	..
Orthopedic	1	45	..	..	..	..
Hospital depts. of institutions	6	1,293	1,104	5	64	12,4	
Total	1	50	29	8	221	74	
Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
City General	12	729	419	66	1,823	12,4	
Church General	1	63	46	..	..	..
Tuberculosis	17	24	476	66	1,823	12,4	
Total							

REGISTERED HOSPITALS

1189

NEW MEXICO—Continued

Nongovernmental		Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Fraternal	Tuberculosis.....	1	40	46	..	..	35
Nonprofit corporations and associations	General.....	6	168	57	33	367	2,747
Tuberculosis.....	1	75	40	1	..	..	125
Industrial.....	3	124	50	..	..	..	845
Orthopedic.....	1	35	12	..	..	..	200
Total.....	11	402	159	34	367	3,917	
Individual and partnership	General.....	7	140	42	27	273	2,688
Corporations (profit unrestricted)	General.....	1	20	5	3	22	261
Grand total.....	55	4,160	2,820	224	3,092	33,317	

NEW YORK

Governmental		Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal	General.....	19	4,309	3,411	..	..	37,960
Nervous and mental.....	12	3,315	3,032	..	..	..	1,162
Tuberculosis.....	12	997	890	..	..	..	1,259
Total.....	23	8,621	7,353	33	314	40,381	
State	General.....	1	36	14	49	93	576
Nervous and mental.....	31	95,100	90,724	..	..	..	20,485
Tuberculosis.....	4	1,050	923	..	3	..	1,007
Orthopedic.....	2	345	146	..	..	..	97
Hospital depts. of institutions.....	9	573	306	..	..	..	6,735
All other hospitals.....	1	30	28	..	..	..	1,232
Total.....	48	97,134	92,141	49	96	30,132	
County	General.....	10	2,133	1,792	111	1,781	23,099
Tuberculosis.....	26	3,161	2,756	2	..	..	2,446
Isolation.....	1	18	1	..	..	..	24
Hospital depts. of institutions.....	7	1,763	1,441	..	..	..	2,000
Total.....	44	7,075	5,990	113	1,781	27,569	
City	General.....	30	15,273	14,213	1,124	23,526	206,672
Tuberculosis.....	6	3,213	3,201	10	29	7,668	..
Isolation.....	5	754	350	..	..	..	4,478
Hospital depts. of institutions.....	4	3,199	3,068	..	..	..	5,584
All other hospitals.....	2	277	259	..	..	..	1,781
Total.....	47	22,716	21,151	1,134	23,555	316,183	
City-county	Tuberculosis.....	1	131	125	..	..	103
Orthopedic.....	1	120	116	..	..	..	139
Total.....	2	251	241	..	..	..	242
Nongovernmental							
Church	General.....	54	8,700	6,335	1,421	26,448	195,397
Nervous and mental.....	2	400	341	..	..	..	190
Tuberculosis.....	7	1,444	1,295	..	..	..	2,004
Maternity.....	4	173	111	100	2,770	3,039	..
Orthopedic.....	2	252	173	57	775	2,368	..
Convalescent and rest.....	3	310	278	..	..	..	349
Hospital depts. of institutions.....	1	174	116	..	..	..	1,371
All other hospitals.....	5	50	40	..	..	..	64
Total.....	61	751	605	..	..	..	1,417
Fraternal	General.....	2	240	172	6	80	1,069
Tuberculosis.....	1	111	44	..	..	..	94
Hospital depts. of institutions.....	1	77	75	..	..	..	..
Total.....	4	428	291	6	80	..	1,163
Nonprofit corporations and associations	General.....	162	24,531	18,338	3,899	74,525	546,032
Nervous and mental.....	5	677	490	..	..	..	3,768
Tuberculosis.....	4	1,378	1,141	..	..	..	1,389
Maternity.....	1	349	228	177	3,344	5,863	..
Industrial.....	6	28	12	..	..	..	214
Children's.....	3	643	363	..	..	..	36,517
Orthopedic.....	8	389	463	48	1,075	10,153	..
Convalescent and rest.....	12	1,205	971	..	..	..	12,293
Hospital depts. of institutions.....	6	1,217	1,106	..	..	..	8,991
All other hospitals.....	2	881	624	..	..	..	3,446
Total.....	220	31,805	23,986	4,124	78,944	631,769	

NEW YORK—Continued

Nongovernmental		Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Individual and partnership	General.....	31	962	500	301	4,341	20,015
Nervous and mental.....	14	515	365	..	..	..	804
Tuberculosis.....	12	33	20	..	..	..	45
Convalescent and rest.....	12	331	237	..	..	..	1,280
Maternity.....	7	165	72	154	2,399	2,670	
Total.....	66	2,008	1,194	457	6,741	24,814	
Corporations (profit unrestricted)	General.....	29	2,504	1,594	612	11,694	62,232
Nervous and mental.....	11	1,370	916	..	..	..	2,794
Maternity.....	1	24	13	26	473	..	486
Convalescent and rest.....	1	24	14	..	..	..	119
Total.....	42	3,922	2,537	638	12,167	65,631	
Grand total.....	577	180,223	164,268	8,192	153,671	1,344,074	

NORTH CAROLINA

Governmental		Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal	General.....	3	163	124	16	193	3,484
Tuberculosis.....	1	850	796	..	..	..	1,323
Total.....	4	1,013	920	16	193	4,807	
State	Nervous and mental.....	4	7,549	7,312	..	..	2,044
Tuberculosis.....	2	930	833	..	..	..	1,034
Orthopedic.....	1	160	161	..	..	..	441
Hospital depts. of institutions.....	2	143	91	..	..	..	1,949
Total.....	9	8,782	8,397	..	..	..	5,468
County	General.....	6	352	292	39	699	7,541
Tuberculosis.....	9	607	488	..	..	..	552
Total.....	15	959	780	39	699	8,093	
City	General.....	3	378	249	35	838	8,532
City-county	General.....	4	232	121	20	599	4,547
Tuberculosis.....	1	24	25	..	..	..	41
Total.....	5	256	146	29	599	4,588	
Nongovernmental							
Church	General.....	15	1,102	825	154	3,335	29,751
Hospital depts. of institutions.....	1	25	6	..	..	..	300
Total.....	16	1,127	831	154	3,335	30,051	
Fraternal	Tuberculosis.....	1	20	12	..	..	10
Nonprofit corporations and associations	General.....	67	4,403	2,825	538	9,558	113,861
Tuberculosis.....	1	40	38	..	..	..	32
Maternity.....	1	40	1	4	29	..	35
Industrial.....	1	50	30	..	..	..	703
Children's.....	1	113	75	12	167	1,310	..
Orthopedic.....	1	25	20	..	..	..	20
Hospital depts. of institutions.....	1	25	3	..	..	..	175
Total.....	75	4,696	2,992	554	9,774	118,136	
Individual and partnership	General.....	12	230	92	54	700	6,600
Nervous and mental.....	2	117	69	..	..	..	268
Tuberculosis.....	3	110	75	..	..	..	147
Eye, ear, nose and throat.....	3	62	26	..	..	..	3,226
Children's.....	1	55	26	..	..	..	165
Convalescent and rest.....	2	35	14	..	..	..	403
Total.....	23	609	301	54	700	10,821	
Corporations (profit unrestricted)	General.....	11	457	290	65	639	12,613
Nervous and mental.....	3	225	92	..	..	..	971
Tuberculosis.....	2	41	26	..	..	..	91
Total.....	16	723	408	65	639	13,715	
Grand total.....	167	18,563	15,036	916	16,777	201,221	

NEBRASKA—Continued

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
County	General.....	1	400	314	12	55	2,205
City	General.....	3	188	114	33	579	3,979
	Isolation.....	1	40	4	..	..	80
Total.....		4	228	118	33	579	4,059
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	26	2,263	1,332	343	6,354	51,133
	Nervous and mental.....	1	150	144	..	..	21
	Maternity.....	1	71	42	18	109	116
Total.....		28	2,484	1,518	361	6,463	51,270
Nonprofit corporations and associations	General.....	6	220	115	39	610	5,692
Individual and partnership	General.....	43	679	276	182	1,712	12,080
Corporations (profit unrestricted)	General.....	3	160	122	18	191	1,152
Grand total.....		98	10,460	8,498	685	10,218	85,578

NEVADA

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	5	145	82	12	74	1,695
State	Nervous and mental.....	1	375	346	..	..	77
County	General.....	6	378	238	39	508	4,056
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	1	75	61	15	240	1,894
Nonprofit corporations and associations	General.....	2	60	20	10	123	700
Corporations (profit unrestricted)	General.....	1	35	24	11	121	1,076
Grand total.....		16	1,068	780	87	1,156	10,398

NEW HAMPSHIRE

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	1	150	36	..	..	453
State	Nervous and mental.....	2	2,891	2,793	..	..	713
	Tuberculosis.....	1	140	103	..	..	60
Total.....		3	3,031	2,901	..	..	779
County	General.....	4	243	199	23	296	3,507
	Hospital depts. of institutions....	1	67	51	..	..	137
Total.....		5	310	250	23	296	3,444
City	General.....	1	60	50	15	242	1,762
	Isolation.....	1	67	10	..	..	184
Total.....		2	126	60	15	242	1,886
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	4	329	223	44	650	7,796
	Maternity.....	1	22	10	19	287	302
Total.....		5	351	233	63	937	8,098
Nonprofit corporations and associations	General.....	24	1,354	801	267	3,563	27,413
	Convalescent and rest.....	1	52	59	..	..	9
	Hospital depts. of institutions....	1	53	12	..	..	816
Total.....		26	1,459	863	267	3,582	28,228
Corporations (profit unrestricted)	General.....	1	80	70	25	201	2,277
	Tuberculosis.....	1	105	76	..	..	85
Total.....		2	185	146	25	201	2,362
Grand total.....		44	5,623	4,459	333	5,644	45,261

NEW JERSEY

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	4	240	94	10	34	3,356
	Nervous and mental.....	1	1,392	1,034	..	..	28
Total.....		5	1,632	1,178	10	34	3,384
State	Tuberculosis.....	1	494	452	..	..	33
	Nervous and mental.....	8	16,101	15,700	1	6	3,311
	Hospital depts. of institutions....	7	353	191	3	20	852
Total.....		16	16,950	16,343	4	26	7,180
County	General.....	3	533	502	..	..	1,840
	Nervous and mental.....	6	5,961	5,652	..	..	1,394
	..	10	2,365	2,207	..	3	2,334
	..	1	272	200	284	5,332	6,587
	..	3	1,216	535	..	..	4,411
Total.....		23	10,347	9,090	284	5,333	16,579
City	General.....	3	1,679	1,505	57	2,142	35,831
	Isolation.....	5	656	309	..	..	1,255
	Convalescent and rest.....	1	155	140	..	..	60
	Hospital depts. of institutions....	1	98	88	..	..	316
Total.....		10	2,588	2,042	57	2,142	37,551
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	16	3,314	2,253	435	9,122	70,736
	Maternity.....	1	8	6	7	50	71
	Hospital depts. of institutions....	1	15	9	..	..	48
Total.....		18	3,337	2,268	442	9,172	70,855
Fraternal	Orthopedic.....	1	100	45	..	..	111
Nonprofit corporations and associations	General.....	59	7,307	5,412	1,415	27,748	187,202
	Nervous and mental.....	2	725	681	..	..	334
	Tuberculosis.....	2	317	237	..	..	723
	Maternity.....	1	58	20	15	40	48
	Eye, ear, nose and throat.....	1	65	33	..	..	2,210
	Children's.....	1	60	37	..	..	1,269
	Orthopedic.....	5	602	323	..	..	3,981
	Convalescent and rest.....	1	40	29	..	..	253
	Hospital depts. of institutions....	2	66	22	..	..	1,674
Total.....		74	9,240	6,794	1,430	27,788	197,294
Individual and partnership	General.....	4	76	37	21	192	2,106
	Nervous and mental.....	3	67	37	..	..	114
	Tuberculosis.....	13	74	61	..	..	54
	Convalescent and rest.....	2	35	28	..	..	50
Total.....		11	252	163	21	192	2,324
Corporations (profit unrestricted)	General.....	1	90	31	..	..	54
	Nervous and mental.....	5	220	163	2	4	297
	Tuberculosis.....	2	108	58	..	..	75
	Convalescent and rest.....	1	30	12	..	..	92
Total.....		9	448	264	2	4	550
Grand total.....		167	44,894	38,193	2,250	44,703	337,791

NEW MEXICO

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	13	1,033	705	51	310	11,246
	Tuberculosis.....	2	337	283	..	..	251
Total.....		15	1,370	988	51	310	11,497
State	General.....	1	76	9	5	66	291
	Nervous and mental.....	2	916	925	..	..	271
	Tuberculosis.....	1	86	71	..	..	116
	Orthopedic.....	1	125	82	..	..	212
	Hospital depts. of institutions....	1	45	7	..	..	171
Total.....		6	1,798	1,101	5	66	1,244
City	General.....	1	50	29	8	221	710
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	12	759	419	66	1,823	12,777
	Tuberculosis.....	1	65	46	..	..	61
Total.....		13	824	465	66	1,884	12,838

NEW MEXICO—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Fraternal						
Tuberculosis.....	1	46	46	..	...	35
Nonprofit corporations and associations						
General.....	6	168	57	33	367	2,747
Tuberculosis.....	1	75	40	1	...	125
Industrial.....	3	124	50	..	...	845
Orthopedic.....	1	35	12	..	...	200
Total.....	11	402	159	34	367	3,917
Individual and partnership						
General.....	7	140	42	27	273	2,688
Corporations (profit unrestricted)						
General.....	1	20	5	3	22	261
Grand total.....	55	4,160	2,620	224	3,092	33,317

NEW YORK

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	19	4,309	3,411	33	314	37,960
Nervous and mental.....	2	3,315	3,052	..	...	1,162
Tuberculosis.....	2	997	890	..	...	1,259
Total.....	23	8,621	7,353	33	314	40,381
State						
General.....	1	36	14	49	93	576
Nervous and mental.....	31	95,100	90,724	..	3	20,485
Tuberculosis.....	4	1,050	923	..	...	1,007
Orthopedic.....	2	345	146	..	...	97
Hospital depts. of institutions.....	9	573	306	..	...	6,785
All other hospitals.....	1	30	28	..	...	1,232
Total.....	48	97,134	92,141	49	96	30,132
County						
General.....	10	2,133	1,792	111	1,781	23,099
Tuberculosis.....	26	3,161	2,756	2	...	2,446
Isolation.....	1	18	1	..	...	24
Hospital depts. of institutions.....	7	1,763	1,441	..	...	2,000
Total.....	44	7,075	5,990	113	1,781	27,569
City						
General.....	30	15,273	14,213	1,124	23,526	296,672
Tuberculosis.....	6	3,213	3,261	10	29	7,608
Isolation.....	5	754	350	..	...	4,478
Hospital depts. of institutions.....	4	3,199	3,068	..	...	5,584
All other hospitals.....	2	277	259	..	...	1,781
Total.....	47	22,716	21,151	1,134	23,555	316,183
City-county						
Tuberculosis.....	1	131	125	..	...	103
Orthopedic.....	1	120	116	..	...	139
Total.....	2	251	241	..	...	242
Nongovernmental						
Church						
General.....	54	8,709	6,335	1,421	26,448	195,397
Nervous and mental.....	2	400	341	..	...	190
Tuberculosis.....	7	1,444	1,295	..	...	2,004
Maternity.....	4	173	111	160	2,770	3,039
Children's.....	2	232	173	57	775	2,368
Orthopedic.....	3	310	278	..	...	349
Convalescent and rest.....	3	174	116	..	...	1,371
Hospital depts. of institutions.....	1	50	40	..	...	61
All other hospitals.....	5	751	695	..	...	1,417
Total.....	81	12,263	9,384	1,638	29,993	206,189
Fraternal						
General.....	2	240	172	6	80	1,060
Tuberculosis.....	1	111	44	..	...	94
Hospital depts. of institutions.....	1	77	75	..	...	...
Total.....	4	428	291	6	80	1,163
Nonprofit corporations and associations						
General.....	162	24,531	18,338	3,899	74,525	546,032
Tuberculosis.....	5	677	490	..	...	3,768
Maternity.....	11	1,378	1,141	..	...	1,389
Children's.....	4	349	228	177	3,344	5,863
Orthopedic.....	1	28	12	..	...	214
Convalescent and rest.....	6	643	365	..	...	36,517
Hospital depts. of institutions.....	3	589	463	48	1,075	10,153
All other hospitals.....	8	1,205	971	..	...	12,293
Total.....	12	1,217	1,106	..	...	8,991
All other hospitals.....	6	881	624	..	...	3,446
Total.....	2	307	248	..	...	3,091
Total.....	220	31,805	23,986	4,124	78,944	631,769

NEW YORK—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Individual and partnership						
General.....	31	962	500	301	4,341	20,015
Nervous and mental.....	14	515	365	2	1	804
Tuberculosis.....	2	35	20	..	...	45
Convalescent and rest.....	13	331	237	..	...	1,280
Maternity.....	7	165	72	154	2,399	2,670
Total.....	66	2,008	1,194	457	6,741	24,814
Corporations (profit unrestricted)						
General.....	29	2,504	1,594	612	11,694	62,232
Nervous and mental.....	11	1,370	916	..	...	2,794
Maternity.....	1	24	13	26	473	486
Convalescent and rest.....	1	24	14	..	...	119
Total.....	42	3,922	2,537	638	12,167	65,631
Grand total.....	577	186,223	164,268	8,192	153,671	1,344,074

NORTH CAROLINA

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	3	163	124	16	193	3,484
Tuberculosis.....	1	850	796	..	...	1,323
Total.....	4	1,013	920	16	193	4,807
State						
Nervous and mental.....	4	7,549	7,312	..	...	2,044
Tuberculosis.....	2	930	833	..	...	1,034
Orthopedic.....	1	160	161	..	...	441
Hospital depts. of institutions.....	2	143	91	..	...	1,949
Total.....	9	8,782	8,397	..	...	5,463
County						
General.....	6	352	292	39	699	7,541
Tuberculosis.....	9	607	488	..	...	552
Total.....	15	959	780	39	699	8,093
City						
General.....	3	378	249	35	838	8,532
City-county						
General.....	4	232	121	29	599	4,547
Tuberculosis.....	1	24	25	..	...	41
Total.....	5	256	146	29	599	4,588
Nongovernmental						
Church						
General.....	15	1,102	825	154	3,335	29,751
Hospital depts. of institutions.....	1	25	6	..	...	300
Total.....	16	1,127	831	154	3,335	30,051
Fraternal						
Tuberculosis.....	1	20	12	..	...	10
Nonprofit corporations and associations						
General.....	67	4,403	2,825	538	9,558	115,861
Tuberculosis.....	1	40	38	..	...	32
Maternity.....	1	40	1	4	29	35
Industrial.....	1	50	30	..	...	703
Children's.....	3	113	75	12	187	1,310
Orthopedic.....	1	25	20	..	...	20
Hospital depts. of institutions.....	1	25	3	..	...	175
Total.....	75	4,696	2,992	554	9,774	118,136
Individual and partnership						
General.....	12	230	92	54	700	6,600
Nervous and mental.....	2	117	69	..	...	265
Tuberculosis.....	3	110	75	..	...	147
Eye, ear, nose and throat.....	3	62	26	..	...	3,236
Children's.....	1	55	25	..	...	165
Convalescent and rest.....	2	35	14	..	...	405
Total.....	23	609	301	54	700	10,821
Corporations (profit unrestricted)						
General.....	11	457	290	65	639	12,653
Nervous and mental.....	3	225	92	..	...	971
Tuberculosis.....	2	41	26	..	...	91
Total.....	16	723	408	65	639	13,715
Grand total.....	167	18,563	15,026	946	16,777	201,221

NORTH DAKOTA

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	6	401	206	24	286	4,881
State	Nervous and mental.....	2	3,157	2,775	4	...	651
	Tuberculosis.....	1	368	305	..	3	235
	Hospital depts. of institutions....	1	35	11	..	...	547
Total.....		4	3,560	3,091	4	3	1,433
County	General.....	1	30	16	4	59	340
City	Isolation.....	1	16	1	..	...	25
City-county	Isolation.....	1	10	3	..	...	14
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	23	1,772	1,075	290	4,511	40,429
Nonprofit corporations and associations	General.....	7	250	149	54	718	7,382
	Maternity.....	1	56	29	6	54	83
Total.....		8	306	178	60	772	7,465
Individual and partnership	General.....	6	80	42	30	253	1,550
	Maternity.....	1	15	2	2	41	41
	Eye, ear, nose and throat.....	1	13	7	..	...	501
Total.....		8	108	51	32	294	2,092
Corporations (profit unrestricted)	General.....	1	16	8	4	65	343
Grand total.....		53	6,219	4,629	427	5,990	56,522

OHIO

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	5	1,588	1,298	3	21	11,562
	Nervous and mental.....	1	1,195	1,174	..	...	420
	Hospital depts. of institutions....	1	73	34	..	...	1,321
Total.....		7	2,856	2,506	3	21	13,303
State	General.....	2	424	311	32	683	9,100
	Nervous and mental.....	12	25,637	25,646	1	8	4,882
	Tuberculosis.....	1	240	205	..	...	393
	Hospital depts. of institutions....	7	593	259	3	5	7,673
Total.....		22	26,954	26,321	36	696	22,045
County	General.....	6	586	426	69	1,403	8,680
	Tuberculosis.....	14	2,415	2,063	..	...	2,244
	Hospital depts. of institutions....	3	560	555	..	...	1,013
Total.....		23	3,561	3,044	69	1,408	11,937
City	General.....	17	3,394	2,466	279	7,629	54,000
	Tuberculosis.....	1	434	432	..	...	437
	Isolation.....	2	88	8	..	...	261
	Hospital depts. of institutions....	1	170	161	..	...	289
Total.....		21	4,086	3,067	279	7,629	55,077
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	35	6,217	4,534	672	21,656	161,218
	Maternity.....	6	193	94	167	2,673	3,233
	Children's.....	1	216	128	..	...	4,244
	Orthopedic.....	1	21	21	..	...	15
	Convalescent and rest.....	1	277	241	..	...	211
Total.....		44	6,922	5,068	1,039	24,529	169,926
Fraternal	Hospital depts. of institutions....	4	445	399	..	...	1,795
Nonprofit corporations and associations	General.....	74	7,018	4,695	1,123	25,728	183,928
	Nervous and mental.....	2	135	116	..	...	370
	Tuberculosis.....	1	49	24	..	...	33
	Maternity.....	3	142	109	49	287	245
	Industrial.....	1	25	4	..	...	91
	Children's.....	3	229	178	8	59	6,290
	Orthopedic.....	2	111	79	..	...	198
	Convalescent and rest.....	4	254	217	2	...	650
	Hospital depts. of institutions....	4	86	20	..	...	1,879
Total.....		94	8,699	5,452	1,178	26,655	193,758

OHIO—Continued

Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Individual and partnership	General.....	12	276	133	45	455	6,211
	Nervous and mental.....	3	235	157	..	...	43
	Tuberculosis.....	3	170	120	..	...	151
	Eye, ear, nose and throat.....	1	6	1	..	...	11
	All other hospitals.....	1	13	6	..	...	25
Total.....		19	690	417	45	455	7,259
Corporations (profit unrestricted)	General.....	4	112	55	30	437	2,573
	Nervous and mental.....	10	745	536	..	...	1,335
	Tuberculosis.....	2	260	245	..	...	23
Total.....		16	1,117	836	30	437	3,856
Grand total.....		250	54,731	47,020	2,679	61,200	479,277

OKLAHOMA

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	11	1,524	1,123	90	1,064	17,688
	Tuberculosis.....	1	150	112	..	...	111
	Hospital depts. of institutions....	2	85	32	..	...	1,062
Total.....		14	1,759	1,257	90	1,064	18,861
State	General.....	2	585	531	24	530	8,845
	Nervous and mental.....	6	8,703	8,566	..	1	2,711
	Tuberculosis.....	3	803	750	..	...	1,775
	Hospital depts. of institutions....	2	88	34	..	...	1,441
Total.....		13	10,179	9,881	24	537	14,977
County	General.....	3	145	65	18	424	2,708
City	General.....	5	187	70	24	574	4,093
City-county	General.....	1	15	6	1	10	277
Nongovernmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Church	General.....	7	829	539	129	3,381	21,493
	Maternity.....	1	22	10	30	224	26
Total.....		8	851	549	159	3,608	21,519
Fraternal	General.....	2	81	41	13	216	1,516
Nonprofit corporations and associations	General.....	7	267	132	41	651	6,227
	Orthopedic.....	1	35	26	..	...	71
Total.....		8	302	158	41	651	6,298
Individual and partnership	General.....	51	1,430	591	234	4,159	29,577
	Tuberculosis.....	1	25	13	..	...	12
	Orthopedic.....	1	163	24	..	...	1,737
Total.....		53	1,618	628	234	4,159	31,326
Corporations (profit unrestricted)	General.....	16	637	336	109	1,069	16,753
	Nervous and mental.....	2	67	29	..	...	243
	Orthopedic.....	1	41	22	..	...	57
Total.....		19	805	387	109	1,200	17,053
Grand total.....		126	15,942	15,037	713	13,182	122,311

OREGON

Governmental		Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal	General.....	4	518	393	14	89	4,116
	Nervous and mental.....	2	856	712	..	...	67
Total.....		6	1,494	1,110	14	89	4,273
State	General.....	1	425	350	29	753	7,229
	Nervous and mental.....	3	4,747	4,593	..	...	1,231
	Tuberculosis.....	13	525	514	..	...	471
	Hospital depts. of institutions....	3	72	47	..	...	1,275
Total.....		9	5,779	5,214	29	753	19,207

REGISTERED HOSPITALS

1191

OREGON—Continued

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County							
General.....	1	50	27	12	130	933	
Tuberculosis.....	1	41	58	..	..	97
Total.....	2	91	63	12	130	1,080	
City							
Isolation	1	100	18	..	..	341
Nongovernmental							
Church							
General.....	17	1,985	1,386	301	6,461	53,521	
Maternity.....	1	30	27	7	72	115	
Total.....	18	2,015	1,413	308	6,533	53,636	
Fraternal							
Orthopedic.....	1	50	53	..	..	258
Nonprofit corporations and associations							
General.....	7	292	148	60	1,140	6,637	
Tuberculosis.....	1	40	28	..	..	128
Maternity.....	2	137	76	27	66	186	
Total.....	10	469	252	87	1,215	6,951	
Individual and partnership							
General.....	11	318	150	66	849	6,678	
Nervous and mental.....	1	10	6	..	..	50
Convalescent and rest.....	1	25	13	..	..	151
Total.....	13	353	169	66	849	6,879	
Corporations (profit unrestricted)							
General.....	12	571	311	79	1,027	12,619	
Grand total.....	72	10,972	9,307	596	11,222	97,000	

PENNS

PENNSYLVANIA

Governmental		Hospitals	Beds	Average Census	Basinsets	Births	Patients Admitted
Federal General.....	5	1,607	1,341	2	29	13,831	
Nervous and mental.....	1	1,450	1,475	..	..	299
Total.....	6	3,056	2,816	2	29	14,130	
State General.....	11	1,585	1,315	182	4,895	41,921	
Nervous and mental.....	13	27,928	27,169	..	4	4,446	
Tuberculosis.....	3	2,401	2,241	..	1	1,852	
Orthopedic.....	1	125	128	..	..	185
Hospital depts. of institutions.....	6	230	100	..	..	4,644
Total.....	34	32,269	30,933	182	4,900	53,045	
County General.....	1	40	12	..	..	482
Nervous and mental.....	11	9,037	8,385	4	..	2,838	
Tuberculosis.....	4	411	405	..	..	419
Hospital depts. of institutions.....	2	600	382	..	..	191
Total.....	18	10,088	9,184	4	..	3,920	
City General.....	2	4,206	3,001	66	1,512	26,522	
Nervous and mental.....	1	3,058	3,029	..	..	788
Tuberculosis.....	1	210	234	..	..	217
Isolation.....	6	1,351	248	..	..	3,369
Total.....	10	8,825	6,512	66	1,512	30,847	
City-county General.....	1	35	52	..	..	87
Tuberculosis.....	1	75	35	..	..	700
Hospital depts. of institutions.....	2	130	87	..	..	787
Total.....	4	240	174	..	..	874
Nongovernmental		30	5,762	3,882	831	16,014	
Church General.....	1	175	124	..	..	113,677
Nervous and mental.....	1	104	91	..	..	27
Tuberculosis.....	3	205	136	44	265	132	
Maternity.....	1	50	20	..	..	442
Children's.....	1	50	20	..	..	813
Convalescent and rest.....	4	143	107	4	..	1,007	
Total.....	40	6,439	4,369	879	16,279	116,008	

PENNSYLVANIA—Continued

Nongovernmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
983	Fraternal General.....	1	165	151	..	..	651
97	Orthopedic.....	1	148	138	..	..	419
080	Convalescent and rest.....	1	31	21	..	..	347
	Hospital depts. of institutions....	1	45	35	..	..	23
	Total.....	5	389	345	..	..	1,455
441	Nonprofit corporations and associations	153	20,033	13,833	3,156	64,729	462,857
	General.....	8	2,829	2,772	..	..	1,382
	Nervous and mental.....	6	885	621	..	..	1,188
	Tuberculosis.....	4	298	204	87	1,647	3,787
	Maternity.....	2	301	162	..	..	7,453
	Orthopedic.....	4	400	287	..	..	7,430
	Convalescent and rest.....	5	483	346	..	..	769
	Hospital depts. of institutions....	3	363	335	39	..	1,482
	All other hospitals.....	4	232	198	12	..	907
	Total.....	4	209	160	..	..	1,488
	Individual and partnership	19	26,033	18,958	3,285	66,376	488,734
	General.....	10	379	253	116	1,176	8,100
	Nervous and mental.....	8	391	265	..	..	633
	Maternity.....	3	44	24	44	706	1,007
	Orthopedic.....	1	15	4	..	..	469
	Convalescent and rest.....	1	39	16	..	..	16
	All other hospitals.....	2	51	31	..	..	220
	Total.....	1	15	5	..	..	240
	Corporations (profit unrestricted)	35	1,125	598	160	1,842	10,685
	General.....	6	545	307	91	1,516	11,040
	Nervous and mental.....	2	58	35	..	..	161
	Maternity.....	1	20	10	15	217	441
	Convalescent and rest.....	2	84	68	..	..	238
	Total.....	11	707	420	106	1,733	11,880
	Grand total.....	354	89,071	74,233	4,684	92,671	731,594

RHODE ISLAND

RHODE ISLAND

Governmental		Hospitalis	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	1	214	148	..	10	2,240	
State General.....	1	1,133	816	21	40	967	
Nervous and mental.....	1	3,740	3,479	..	..	684
Tuberculosis.....	1	580	520	..	..	394
Total.....	4	5,453	4,815	21	40	2,049	
City Isolation.....	1	265	185	..	1	1,972	
Church General.....	1	307	189	43	889	5,378	
Tuberculosis.....	1	75	35	..	..	14
Convalescent and rest.....	1	69	68	..	..	21
Total.....	3	451	292	43	889	5,413	
Nonprofit corporations and associations	9	1,471	898	183	3,633	27,944	
General.....	2	224	193	..	..	232
Nervous and mental.....	1	155	104	155	3,181	3,475	
Maternity.....	1	55	44	..	..	157
Convalescent and rest.....	13	1,905	1,239	235	6,514	31,828	
Total.....	2	34	23	..	..	40
Corporations (profit unrestricted)	23	8,322	6,702	402	7,754	43,542	
General.....	2	34	23	..	..	40
Convalescent and rest.....	25	8,322	6,702	402	7,754	43,542	

SOUTH CAROLINA

Governmental		Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal General.....	4	904	612	10	72	6,636	
State General.....	2	5,225	5,139	1	7	1,671	
Nervous and mental.....	1	449	426	..	..	551
Tuberculosis.....	3	5,925	5,263	1	7	2,212	
Total.....	7	11,599	10,837	11	86	8,819	

SOUTH CAROLINA—Continued

Governmental	Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County						
General.....	7	714	558	81	1,626	19,217
Tuberculosis.....	3	239	217	..	...	353
Total.....	10	953	775	81	1,626	19,570
City						
General.....	1	244	182	23	626	6,189
Hospital depts. of institutions....	1	24	2	..	...	175
Total.....	2	268	184	23	626	6,364
City-county						
General.....	1	26	19	..	...	42
Nongovernmental						
Church						
General.....	5	405	268	59	1,012	10,410
Hospital depts. of institutions....	1	36	5	..	...	459
Total.....	6	441	273	59	1,012	10,869
Fraternal						
General.....	1	22	11	2	22	215
Orthopedic.....	1	65	60	..	...	318
Total.....	2	87	71	2	22	533
Nonprofit corporations and associations						
General.....	22	1,548	1,036	184	3,493	41,519
Tuberculosis.....	1	70	32	..	...	42
Hospital depts. of institutions....	1	44	2	..	...	168
Total.....	24	1,662	1,070	184	3,493	41,729
Individual and partnership						
General.....	4	98	56	14	194	3,017
Eye, ear, nose and throat.....	1	15	3	..	...	300
Convalescent and rest.....	1	20	10	..	...	100
Total.....	6	133	69	14	194	3,417
Corporations (profit unrestricted)						
Nervous and mental.....	1	35	20	..	...	280
Grand total.....	59	10,174	8,678	374	7,052	91,632

SOUTH DAKOTA

Governmental	Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal						
General.....	10	680	376	41	493	8,555
Tuberculosis.....	1	112	106	..	...	255
Total.....	11	798	482	41	493	8,810
State						
Nervous and mental.....	2	2,586	2,267	..	...	373
Tuberculosis.....	1	192	139	..	...	109
Hospital depts. of institutions....	1	40	20	..	...	234
Total.....	4	2,818	2,426	..	...	716
County						
General.....	1	16	11	6	69	400
City						
General.....	3	64	34	21	240	1,440
Nongovernmental						
Church						
General.....	14	1,050	672	183	2,614	24,622
Nonprofit corporations and associations						
General.....	10	365	210	79	1,017	8,474
Individual and partnership						
General.....	12	255	118	62	696	5,149
Corporations (profit unrestricted)						
General.....	2	81	58	15	181	1,011
Grand total.....	57	5,447	4,011	407	5,271	51,538

TENNESSEE

Governmental	Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal						
General.....	3	1,145	1,019	..	...	9,785
State						
Nervous and mental.....	4	5,857	6,019	..	1	1,637
Hospital depts. of institutions....	3	105	61	..	...	1,292
Total.....	7	5,962	6,083	..	1	2,929

TENNESSEE—Continued

Governmental	Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
County						
General.....	3	105	32	16	61	1,941
Nervous and mental.....	2	977	1,022	4	8	54
Tuberculosis.....	1	355	238	1	...	55
Hospital depts. of institutions....	1	805	589	..	...	40
Total.....	7	2,242	1,872	21	69	2,422
City						
General.....	3	1,008	837	130	3,223	31,250
City-county						
General.....	1	440	231	60	1,376	9,332
Tuberculosis.....	2	510	467	..	...	35
Children's.....	1	73	44	11	170	1,151
Total.....	4	1,023	742	71	1,546	10,571
Nongovernmental						
Church						
General.....	8	1,224	860	119	3,676	26,382
Nonprofit corporations and associations						
General.....	17	1,372	993	214	2,942	29,458
Tuberculosis.....	2	310	274	..	...	60
Industrial.....	1	10	1	..	16	4
Orthopedic.....	4	172	145	..	...	651
Eye, ear, nose and throat.....	1	65	20	..	...	1,730
Total.....	25	1,929	1,343	214	2,958	33,153
Individual and partnership						
General.....	21	488	209	67	750	9,839
Nervous and mental.....	4	180	63	..	...	76
Orthopedic.....	2	72	51	..	...	1,101
Eye, ear, nose and throat.....	3	36	9	..	...	1,292
Total.....	30	776	372	67	750	12,909
Corporations (profit unrestricted)						
General.....	8	278	108	32	472	5,701
Tuberculosis.....	1	40	14	..	...	55
Total.....	9	318	122	32	472	5,756
Grand total.....	96	15,717	13,230	704	12,700	168,967

TEXAS

Governmental	Hospitals	Beds	Average Census	Basinets	Births	Patients Admitted
Federal						
General.....	11	2,098	1,196	39	434	19,579
Nervous and mental.....	2	1,458	1,190	..	...	1,065
Tuberculosis.....	1	420	440	..	...	2,179
Total.....	14	3,976	2,826	39	434	22,823
State						
General.....	1	50	30	4	45	975
Nervous and mental.....	9	10,379	15,615	2	9	4,018
Tuberculosis.....	2	1,172	995	..	...	2,294
Hospital depts. of institutions....	3	386	163	..	...	6,750
Total.....	15	17,987	16,823	6	54	11,946
County						
General.....	14	725	367	110	2,294	15,291
Tuberculosis.....	3	195	184	..	...	55
Total.....	17	920	551	110	2,294	15,346
City						
General.....	7	829	337	70	2,012	16,557
City-county						
General.....	9	1,583	939	129	5,547	24,041
Tuberculosis.....	3	316	316	..	...	74
Convalescent and rest.....	1	250	296	..	...	15
Total.....	13	2,179	1,481	129	5,547	24,771
Nongovernmental						
Church						
General.....	41	4,173	2,482	634	16,797	125,151
Tuberculosis.....	2	110	66	..	...	45
Maternity.....	3	67	45	42	394	1,151
Hospital depts. of institutions....	1	15	2	..	...	17
Total.....	47	4,359	2,595	677	17,194	126,364
Fraternal						
General.....	1	61	25	17	150	977
Tuberculosis.....	1	159	109	..	...	114
Orthopedic.....	1	63	24	..	...	65
Hospital depts. of institutions....	1	25	18	..	...	147
Total.....	4	209	129	17	150	1,203

TEXAS—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Nonprofit corporations and associations						
General.....	32	1,375	737	185	3,504	36,826
Industrial.....	5	535	242	..	..	7,158
Eye, ear, nose and throat.....	1	24	8	..	..	1,108
Children's.....	2	95	53	..	..	1,277
Orthopedic.....	1	36	24	..	..	454
Total.....	41	2,065	1,064	185	3,504	46,823
Individual and partnership						
General.....	117	2,175	914	428	7,520	53,123
Nervous and mental.....	2	44	34	..	..	180
Tuberculosis.....	5	195	72	..	..	194
Eye, ear, nose and throat.....	2	25	5	..	..	1,106
Orthopedic.....	1	25	12	..	..	246
All other hospitals.....	1	16	9	..	1	360
Total.....	128	2,480	1,046	428	7,521	55,227
Corporations (profit unrestricted)						
General.....	37	1,539	824	228	3,720	43,551
Nervous and mental.....	5	191	119	..	..	763
Tuberculosis.....	1	20	16	..	..	75
Total.....	43	1,750	959	228	3,720	44,395
Grand total.....	329	36,851	28,083	1,885	42,448	383,370

UTAH

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	3	203	160	6	59	2,119
State						
Nervous and mental.....	2	1,676	1,466	..	..	435
Tuberculosis.....	1	104	..	..	..	..
Total.....	3	1,780	1,466	..	..	435
County						
General.....	3	291	177	39	851	5,514
City						
General.....	3	86	46	32	473	1,704
Nongovernmental						
Church						
General.....	4	928	639	180	4,272	21,900
Maternity.....	1	26	17	26	590	617
Children's.....	1	25	18	..	..	97
Total.....	6	979	674	206	4,862	22,614
Fraternal						
Orthopedic.....	1	20	20	..	..	69
Nonprofit corporations and associations						
General.....	7	287	163	82	1,066	7,154
Individual and partnership						
General.....	7	127	56	36	346	1,867
Corporations (profit unrestricted)						
General.....	1	18	7	6	63	253
Grand total.....	34	3,791	2,709	407	7,720	41,729

VERMONT

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	2	226	187	..	7	2,398
State						
Nervous and mental.....	2	1,478	1,399	..	..	381
Tuberculosis.....	1	131	110	..	..	199
Hospital depts. of institutions.....	1	12	7	..	..	117
Total.....	5	1,621	1,516	..	..	697
Nongovernmental						
Church						
General.....	3	215	183	31	462	5,132
Nonprofit corporations and associations						
General.....	15	912	572	169	2,335	20,827
Tuberculosis.....	1	77	64	..	..	151
Total.....	16	989	636	160	2,585	20,978

VERMONT—Continued

Nongovernmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Individual and partnership						
General.....	1	14	5	..	..	110
Corporations (profit unrestricted)						
General.....	2	66	36	12	143	1,157
Nervous and mental.....	2	925	795	..	..	451
Total.....	4	991	831	12	148	1,698
Grand total.....	31	4,056	3,358	203	3,152	39,943

VIRGINIA

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	7	1,865	1,234	30	398	15,615
Nervous and mental.....	1	1,008	1,042	..	..	931
Total.....	8	2,873	2,276	30	398	16,548
State						
General.....	1	367	287	44	765	9,294
Nervous and mental.....	6	10,616	10,499	..	8	3,486
Tuberculosis.....	3	925	736	..	..	1,149
Hospital depts. of institutions.....	4	136	76	..	..	1,590
Total.....	14	12,044	11,508	44	773	15,519
County						
General.....	2	83	44	12	147	1,825
City						
General.....	2	677	495	57	389	3,150
Tuberculosis.....	2	386	293	..	..	251
Isolation.....	1	30	6	..	..	156
Total.....	5	1,093	794	57	389	3,557
Nongovernmental						
Church						
General.....	2	328	166	38	511	6,231
Hospital depts. of institutions.....	1	24	2	..	..	139
Total.....	3	352	168	38	511	6,361
Fraternal						
General.....	1	135	71	15	311	2,677
Nonprofit corporations and associations						
General.....	35	2,969	1,945	356	7,057	75,336
..	2	120	110	..	..	197
..	1	18	6	..	..	139
..	1	25	7	..	..	719
Hospital depts. of institutions.....	1	16	1	..	..	151
Total.....	40	3,148	2,069	356	7,057	76,541
Individual and partnership						
General.....	15	554	258	66	709	11,925
Nervous and mental.....	2	126	114	..	..	320
Tuberculosis.....	1	20	12	..	..	57
Eye, ear, nose and throat.....	1	11	3	..	..	272
Total.....	19	711	357	66	709	12,572
Corporations (profit unrestricted)						
General.....	16	835	555	113	2,225	25,101
Nervous and mental.....	2	185	115	..	..	750
Total.....	18	1,020	670	113	2,225	25,853
Grand total.....	110	21,459	17,987	731	12,529	161,453

WASHINGTON

Governmental	Hospitals	Beds	Average Census	Bassinets	Births	Patients Admitted
Federal						
General.....	11	1,586	1,180	23	277	14,177
Nervous and mental.....	1	710	647	..	..	277
Tuberculosis.....	1	268	210	..	..	1,112
Hospital depts. of institutions.....	1	85	63	..	..	703
Total.....	14	2,649	2,109	23	277	16,269
State						
Nervous and mental.....	4	8,269	7,955	..	2	1,725
Hospital depts. of institutions.....	2	69	25	..	..	2,235
Total.....	6	8,338	7,980	..	2	3,960

WASHINGTON—Continued

REGISTERED HOSPITALS

JOHN A. M.
MARCH 10, 1914

Governmental					
	Hospitals	Beds	Average Census	Births	Patients Admitted
County General.....	6	858	739	107	2,010
Tuberculosis.....	6	597	629	...	10,500
Convalescent and rest.....	1	275	252	...	564
Total.....	13	1,730	1,510	107	20,946
City Tuberculosis.....	1	250	220	...	167
Isolation.....	1	100	6	...	130
Total.....	2	350	226	...	297
Nongovernmental					
Church General.....	20	2,496	1,481	419	8,263
Maternity.....	1	46	25	35	55,728
Total.....	21	2,542	1,506	454	55,868
Fraternities	1	24	20	...	120
Orthopedic.....	19	1,577	1,220	322	5,711
Nonprofit corporations and associations	3	81	63	...	45,477
General.....	1	66	39	31	92
Tuberculosis.....	1	132	90	...	128
Maternity.....	1	20	18	...	1,325
Orthopedic.....	25	1,876	1,432	333	47,100
Convalescent and rest.....	19	450	173	100	1,212
Total.....	1	20	12	...	10,551
Individual and partnership	1	85	79	...	89
General.....	1	11	4	...	185
Tuberculosis.....	22	566	268	100	1,212
Convalescent and rest.....	5	225	99	50	10,936
Total.....	3	73	41	...	5,184
Corporations (profit unrestricted)	8	298	140	50	5,538
General.....	112	18,403	15,200	1,087	18,406
Nervous and mental.....	...	...	...	...	161,054
Total.....	...	...	...	...	...

WEST VIRGINIA

Governmental					
	Hospitals	Beds	Average Census	Births	Patients Admitted
Federal General.....	1	317	193	...	1,991
State General.....	3	243	129	12	5,952
Nervous and mental.....	5	4,090	3,371	4	1,301
Tuberculosis.....	3	1,051	918	...	767
Hospital depts. of institutions.....	1	86	48	...	540
Total.....	12	5,470	4,666	16	8,554
County General.....	2	110	58	12	1,830
Tuberculosis.....	2	67	62	...	42
Total.....	1	177	120	12	1,872
Nongovernmental					
Church General.....	1	165	70	20	2,585
Nonprofit corporations and associations	9	1,000	512	121	3,326
General.....	12	1,238	821	149	2,254
Tuberculosis.....	1	41	25	14	15
Maternity.....	2	20	14	...	...
Orthopedic.....	1	80	47	...	...
Convalescent and rest.....	1	75	33	...	...
Total.....	17	1,494	952	167	2,929
Individual and partnership	15	663	326	72	562
General.....	1	5	3	...	...
Corporations (profit unrestricted)	16	658	329	72	562
General.....	21	1,546	920	149	1,717
Total.....	51	19,897	7,891	543	8,335
Grand total.....	...	...	...	...	125,735

WISCONSIN

Governmental					
	Hospitals	Beds	Average Census	Births	Patients Admitted
Federal General.....	2	1,292	1,038	10	163
Nervous and mental.....	1	205	205	...	...
Total.....	3	1,597	1,333	10	163
State General.....	4	650	638	22	391
Nervous and mental.....	6	4,410	4,291	5	125
Tuberculosis.....	2	290	250	...	...
Hospital depts. of institutions.....	2	51	23	...	...
Total.....	10	5,401	5,202	27	1,502
County General.....	4	1,203	908	90	1,747
Nervous and mental.....	37	11,146	10,575	...	21,824
Tuberculosis.....	18	1,706	1,675	1	1
Hospital depts. of institutions.....	2	130	92	...	2,401
Total.....	61	14,185	13,010	91	1,748
City General.....	9	341	217	95	1,538
Isolation.....	3	368	107	...	1,773
Total.....	12	709	324	95	1,338
City-county General.....	1	55	36	16	211
Nongovernmental					
Church General.....	56	6,054	3,775	1,038	19,487
Nervous and mental.....	3	563	510	...	15,116
Tuberculosis.....	1	62	61	...	23
Maternity.....	1	76	46	14	129
Convalescent and rest.....	2	100	96	...	15
Total.....	63	6,855	4,488	1,052	13,800
Nonprofit corporations and associations	23	1,679	1,005	324	5,862
General.....	1	54	42	...	4,574
Nervous and mental.....	1	55	42	...	8
Tuberculosis.....	1	220	111	...	6
Children's.....	31	2,008	1,203	334	5,862
Total.....	23	519	259	150	1,586
Individual and partnership	6	107	110	32	5,584
General.....	5	332	248	4	8
Corporations (profit unrestricted)	11	529	358	56	235
Nervous and mental.....	226	31,818	26,224	1,511	31,735
Total.....	...	...	...	...	263,219

WYOMING

Governmental					
	Hospitals	Beds	Average Census	Births	Patients Admitted
Federal General.....	3	430	395	12	124
Nervous and mental.....	1	593	565	...	5,224
Total.....	4	1,023	870	12	6,114
State General.....	1	100	59	12	2,673
Nervous and mental.....	2	1,010	934	1	25
Tuberculosis.....	1	23	26	...	42
Total.....	4	1,143	1,019	13	2,742
Nongovernmental					
Church General.....	4	202	195	34	1,276
Nonprofit corporations and associations	2	45	22	19	25
General.....	3	75	29	15	1,777
Individual and partnership	19	176	75	29	413
Corporations (profit unrestricted)	2	59	15	13	...
General.....	29	2,522	2,229	195	2,674

HOSPITALS REGISTERED BY THE AMERICAN MEDICAL ASSOCIATION

The following list contains the names of 6,226 hospitals, sanatoriums and related institutions that are located in the United States and 258 in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands. The list for each state is presented in two groups: (1) hospitals and sanatoriums, and (2) related institutions. The related institutions include school and prison infirmaries, nursing homes and other institutions designed to give certain medical and nursing care in an ethical and acceptable manner, without giving a full hospital service.

Registration of hospitals is governed by the Essentials of a Registered Hospital, adopted by the House of Delegates in 1928 and revised in 1939. See text of the Essentials at the end of this list.

Registration is a basic recognition, extended to all the hospitals and related institutions in the following list, concerning which we have no evidence of irregular or unsafe practices. Approval is designation of certain registered institutions by the Council on Medical Education and Hospitals for internships, residencies and fellowships, or by the American College of Surgeons as unconditionally meeting their minimum standards.

KEY TO SYMBOLS AND ABBREVIATIONS

- * Approved for training interns by the Council on Medical Education and Hospitals. List with detailed information is sent on request.
 - + Approved for residencies or fellowships. List with detailed information is sent on request.
 - ▲ Approved by American College of Surgeons as meeting unconditionally its minimum standards.
- ◊ School of nursing accredited by state board of nurse examiners.
 - ⊙ Affiliated for nurse training on state accredited basis.
 - ¹ Figures given are for number of beds set up for use, not necessarily the rated capacity for which the buildings were properly designed.
 - † Figures for "average census" and "admissions" are exclusive of newborn infants.

The column headed "Type of Service" tells what diseases are treated in each institution:

Card	Cardiac	ENT	Eye, ear, nose and throat	Inst	Institutional	N&M	Nervous and mental
Chil	Children	Gen	General	Mat	Maternity	Orth	Orthopedic
Chr	Chronic	Incur	Incurable	MatCh	Maternity and children	SkCa	Skin and cancer
Conv	Convalescent and rest	Indus	Industrial	MeDe	Mentally deficient	TB	Tuberculosis
Drug	Drug and alcoholic	Iso	Isolation	Ment	Mental	Ven	Venereal
Epil	Epileptic						

The column headed "Control" indicates control, or auspices under which the institution is conducted:

GOVERNMENTAL			NONPROFIT ORGANIZATIONS		PROPRIETARY	
Fed	Federal	State	Church	Indiv	Indiv	Individual
IA	Indian Affairs	City	City	Part	Part	Partnership
Army	United States Army	County	Fraternal	Corp	Corp	Corporation
Navy	United States Navy	City-County	NPAssn			(unrestricted as to profit)
USPHS	United States Public Health Service	CyCo				
Vet	Veterans Administration Facility					

The accompanying list was corrected by additions and removals of hospitals up to the time of going to press; totals of the list, therefore, may vary from tables 1 and 2, which were necessarily compiled earlier.

ALABAMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Bassinets	Number of Births	Admissions †
Albertville, 2,716—Marshall Sand Mountain Infirmary.. Gen	Indiv		24	4	2	37	193
Alexander City, 4,519—Tallapoosa Russell Hospital	Gen	Indiv	54	10	4	15	300
Aniston, 22,345—Calhoun Garner Hospital▲.....	Gen	City	66	40	10	175	1,436
Station Hospital	Gen	Army	118	70	2	24	1,841
Sue Parker Stringfellow Memorial Hospital	TB	NPAssn	15	16	..	..	53
Atmore, 3,035—Escambia Atmore General Hospital.. Gen	NPAssn		24	8	2	32	470
Bellamy, 317—Sumter Bellamy Hospital	Gen	Indiv	18	4	2	11	240
Bessemer, 20,721—Jefferson Bessemer General Hospital▲ Gen	Corp		72	18	4	45	728
Birmingham, 259,678—Jefferson Baptist Hospitals▲.....	Gen	Church	180	122	16	523	5,715
Children's Hospital▲.....	Chil	NPAssn	50	30	..	..	1,144
Hill Crest Sanitarium.....	N&M	Indiv	50	24	..	..	448
Hillman Hospital▲.....	Gen	County	437	354	40	2,460	12,854
Jefferson Sanatorium.....	TB	County	100	83	..	..	316
Norwood Hospital▲.....	Gen	NPAssn	210	97	16	366	5,589
St. Vincent's Hospital▲.....	Gen	Church	131	111	6	205	4,143
South Highlands Infirmary▲ Gen	Corp		148	90	25	687	4,095
365 Crippled Children's Clinic Orth	NPAssn		45	32	..	..	267
Brewton, 2,818—Escambia Brewton Memorial Hospital. Gen	Indiv		20	5	4	16	164
Clanton, 1,847—Chilton Central Alabama Hospital.. Gen	NPAssn		28	12	2	13	347
Cullman, 2,786—Cullman Cullman Hospital	Gen	County	31	..	10	Estab. 1939	
Decatur, 15,800—Morgan Benevolent Society Hospital▲ Gen	NPAssn		50	30	4	84	888
Demopolis, 4,037—Marengo Juanita Coleman Hospital.. Gen	Indiv		12	3	4	8	100
Dothan, 16,046—Houston Fraser-Ellis Hospital▲.....	Gen	Indiv	60	52	6	72	1,806
Moody Hospital▲.....	Gen	Indiv	100	35	6	110	1,295

ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Bassinets	Number of Births	Admissions †
Enterprise, 3,702—Coffee Gibson Hospital	Gen	Indiv	30	7	3	33	559
Enfauila, 5,208—Barbour Britt Infirmary.....	Gen	Indiv	50	20	6	31	651
Salter Hospital.....	Gen	Indiv	50	22	6	68	967
Fairfield, 11,039—Jefferson Employees' Hospital of the Tennessee Coal, Iron and Railroad Company▲.....	Gen	NPAssn	261	174	30	777	6,049
Flint (Decatur P.O.), 134—Morgan Morgan County Tuberculosis Sanatorium	TB	County	44	31	..	..	120
Floral, 2,580—Covington Young Infirmary and Lakeview Hospital	Gen	Indiv	40	11	3	32	425
Florence, 11,729—Lauderdale Eliza Coffee Memorial Hospital	Gen	City	40	19	6	97	1,058
Gadsden, 24,042—Etowah Forrest General Hospital.. Gen	Indiv		50	25	12	133	1,290
Holy Name of Jesus Hospital▲.....	Gen	Church	96	60	18	219	4,294
Greenville, 3,985—Butler Speir Hospital	Gen	Indiv	47	7	5	41	457
Stabler Infirmary	Gen	Part	42	17	6	64	679
Huntsville, 11,554—Madison Huntsville Hospital	Gen	NPAssn	60	40	4	114	1,715
Jackson, 1,828—Clarke South Alabama Infirmary.. Gen	Corp		16	4	2	31	168
Jasper, 5,313—Walker Peoples Hospital.....	Gen	County	65	50	4	97	1,255
Walker County Hospital▲.....	Gen	Corp	50	22	2	53	1,005
Lafayette, 2,119—Chambers Batson Memorial Sanatorium	TB	County	47	..	..	Estab. 1939	
Mobile, 68,202—Mobile City Hospital▲.....	Gen	CyCo	128	110	18	505	3,620

Jour. A. M.
March 23, 1915

ARIZONA

Hospitals and Sanatoriums

	Type of Service	Ownership or Control	Beds	Average Census	Basins	Number of Births	Admissions
Ajo, 1,100—Pima	Gen	NPAasn	23	10	5	59	23
Phelps Dodge Hospital	Gen	NPAasn	45	18	6	137	17
Bisbee, 8,023—Cochise	Gen	NPAasn	100	71	5	60	73
Copper Queen Hospital	Gen	NPAasn	251	185	14	18	221
Chin Lee, 63—Apache	Gen	NPAasn	65	30	2	8	65
Chin Lee General Hospital	Gen	NPAasn	150	88	13	113	146
Douglas, 9,828—Cochise	Gen	NPAasn	50	41	6	68	61
Cochise County Hospital	Gen	NPAasn	52	25	4	68	29
Flagstaff, 3,891—Cocconino	Gen	NPAasn	38	25	3	37	85
Flagstaff Hospital	Gen	NPAasn	20	20	5	118	68
Fort Defiance, 600—Apache	Gen	NPAasn	25	17	2	20	20
Fort Defiance Sanatorium	Gen	NPAasn	50	31	8	222	143
Navajo Medical Center Hospital and Sanatorium	Unit of Navajo Medical Center Hospital	Gen	40	13	4	150	75
Fort Huachuca, 1,500—Cochise	Gen	NPAasn	26	10	8	62	76
Station Hospital	Gen	NPAasn	928	900	...	...	87
Gannado, 150—Apache	Gen	NPAasn	50	...	...	...	...
Sage Memorial Hospital	Gen	NPAasn	165	...	...	...	...
Globe, 7,157—Gila	Gen	NPAasn	67	...	...	...	...
Gila County Hospital	Gen	NPAasn	139	...	...	...	...
Jerome, 4,932—Yavapai	Gen	NPAasn	208	...	...	...	...
United Verde Hospital	Gen	NPAasn	65	...	...	...	...
Keams Canyon, 150—Navajo	Gen	NPAasn	144	...	...	...	...
Hopi General Hospital	Gen	NPAasn	150	...	...	...	...
Kingman, 2,200—Mohave	Gen	NPAasn	144	...	...	...	...
Mohave General Hospital	Gen	NPAasn	150	...	...	...	...
Leupp, 200—Cocconino	Gen	NPAasn	30	...	...	...	...
Leupp Indian Hospital	Gen	NPAasn	25	...	...	...	...
Mesa, 3,711—Maricopa	Gen	NPAasn	20	...	...	...	...
South Side District Hospital	Gen	NPAasn	20	...	...	...	...
Miami, 7,093—Gila	Gen	NPAasn	20	...	...	...	...
Morenci, 2,200—Greenlee	Gen	NPAasn	20	...	...	...	...
Phelps Dodge Hospital	Gen	NPAasn	20	...	...	...	...
Phoenix, 48,118—Maricopa	Gen	NPAasn	20	...	...	...	...
Arizona State Hospital	Gen	NPAasn	20	...	...	...	...
Booker T. Washington Memorial Hospital	Gen	NPAasn	20	...	...	...	...
Good Samaritan Hospital	Gen	NPAasn	20	...	...	...	...
Phoenix Indian Hospital	Gen	NPAasn	20	...	...	...	...
St. Joseph's Hospital	Gen	NPAasn	20	...	...	...	...
St. Luke's Hospital	Gen	NPAasn	20	...	...	...	...
Prescott, 5,517—Yavapai	Gen	NPAasn	20	...	...	...	...
Pamsetgaaf Sanatorium	Gen	NPAasn	20	...	...	...	...
St. Luke's in the Mountains	Gen	NPAasn	20	...	...	...	...
Ray, 1,100—Pinal	Gen	NPAasn	20	...	...	...	...
Ray Hospital	Gen	NPAasn	20	...	...	...	...
Santon, 315—Pinal	Gen	NPAasn	20	...	...	...	...
Safford, 1,706—Graham	Gen	NPAasn	20	...	...	...	...
Morris-Squibb Hospital	Gen	NPAasn	20	...	...	...	...
San Carlos, 100—Gila	Gen	NPAasn	20	...	...	...	...
Sells, 250—Pima	Gen	NPAasn	20	...	...	...	...
Indian Oasis Hospital	Gen	NPAasn	20	...	...	...	...
Tempe, 2,495—Maricopa	Gen	NPAasn	20	...	...	...	...
State Welfare Sanatorium	Gen	NPAasn	20	...	...	...	...
Tuba City, 150—Cocconino	Gen	NPAasn	20	...	...	...	...
Western Navajo Hospital	Gen	NPAasn	20	...	...	...	...
Tucson, 32,500—Pima	Gen	NPAasn	20	...	...	...	...
Anson Rest Home	Gen	NPAasn	20	...	...	...	...
Barfield Sanatorium	Gen	NPAasn	20	...	...	...	...
Desert Sanatorium of South-ern Arizona	Gen	NPAasn	20	...	...	...	...
Pima County General Hos-pital	Gen	NPAasn	20	...	...	...	...
St. Luke's in the Desert Sanatorium	Gen	NPAasn	20	...	...	...	...
St. Mary's Hospital and Sanatorium	Gen	NPAasn	20	...	...	...	...
Southern Pacific Sanatorium	Gen	NPAasn	20	...	...	...	...
Veterans Admin. Facility	Gen	NPAasn	20	...	...	...	...
Whipple, —Yavapai	Gen	NPAasn	20	...	...	...	...
Veterans Admin. Facility	Gen	NPAasn	20	...	...	...	...
Whiteriver, 500—Navajo	Gen	NPAasn	20	...	...	...	...
Fort Apache Agency Hos-pital	Gen	NPAasn	20	...	...	...	...
Wickenburg, 724—Maricopa	Gen	NPAasn	20	...	...	...	...
Wickenburg Hospital	Gen	NPAasn	20	...	...	...	...
Winslow, 3,917—Navajo	Gen	NPAasn	20	...	...	...	...
Winslow Indian Sanatorium	Gen	NPAasn	20	...	...	...	...
Yuma, 4,592—Yuma	Gen	NPAasn	20	...	...	...	...
Fort Yuma Indian Hos-pital	Gen	NPAasn	20	...	...	...	...
Yuma County General Hos-pital	Gen	NPAasn	20	...	...	...	...
Related Institutions							
Kayenta, 40—Navajo	Gen	NPAasn	20	...	...	...	...
Kayenta Sanatorium	Gen	NPAasn	20	...	...	...	...
McNary, 55—Apache	Gen	NPAasn	20	...	...	...	...
McNary Hospital	Gen	NPAasn	20	...	...	...	...
Nogah, 6,692—Santa Cruz	Gen	NPAasn	20	...	...	...	...
St. Joseph's Hospital	Gen	NPAasn	20	...	...	...	...
Oracle, 200—Pinal	Gen	NPAasn	20	...	...	...	...
La Casa del Encanto	Conv	Indiv	20	...	...	...	...

Key to symbols and abbreviations is on page 1195

ARIZONA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Parker, 200—Yuma							
Colorado River Indian Agency Hospital	Gen	IA	40	14	4	21	504
Prescott, 5,517—Yavapai							
Yavapai County Hospital. Inst Gen County			70	48	4	84	573
Tucson, 32,506—Pima							
Arizona State Elks Association Hospital	TB	Frat	25	14	..	..	20
Comstock Children's Hosp..	TB	NPAasn	35	28	..	..	81
Means Rest Home	Conv	Indiv	27	24	..	..	34
Reardon Sanatorium	TB	Indiv	12	9	..	..	28
San Xavier Indian Sanatorium	TB	IA	46	37	..	..	79
Valentine, 110—Mohave							
Truxton Canyon Hospital..	Gen	IA	10	11	3	23	365

ARKANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Alexander, 141—Pulaski							
McRae Memorial Sanatorium TB		State	39	39	..	..	50
Arkadelphia, 3,380—Clark							
Townsend Hospital	Gen	Indiv	16	4	4	17	172
Batesville, 4,484—Independence							
Dr. Gray's Hospital	Gen	Indiv	40	15	6	25	540
Johnston and Craig Hosp..	Gen	Part	12	5	1	23	384
Benton, 3,445—Saline							
Blakely Hospital	Gen	Indiv	16	3	2	21	220
Blytheville, 10,095—Mississippi							
Blytheville Hospital	Gen	Indiv	40	17	6	91	718
Walls Hospital	Gen	Indiv	25	17	4	32	933
Camden, 7,273—Ouachita							
Camden Hospital	Gen	NPAasn	30	13	9	177	949
Charleston, 851—Franklin							
Hollinger Hospital	Gen	Indiv	15	5	..	33	80
Clarksville, 3,031—Johnson							
Clarksville Municipal Hosp..	Gen	Church	26	14	5	19	466
Conway, 5,534—Faulkner							
Conway Memorial Hospital. Gen		City	40	5	4	36	300
Crossett, 2,811—Ashley							
Crossett Hospital	Gen	NPAasn	50	15	6	86	577
De Queen, 2,938—Sevier							
Archer Hospital	Gen	Indiv	25	8	2	20	471
Dyess, 1,000—Mississippi							
Dyess Hospital	Gen	NPAasn	26	5	4	84	331
El Dorado, 16,421—Union							
Henry C. Rosamond Memorial Hospital	Gen	Corp	28	6	8	22	1,215
Warner Brown Hospital	Gen	Church	81	54	8	251	1,922
Fayetteville, 7,394—Washington							
Fayetteville City Hospital..	Gen	City	60	31	8	150	1,461
Veterans Admin. Facility..	Gen	Vet	258	229	..	..	2,213
Fort Smith, 31,429—Sebastian							
Arkansas Tuberculosis Sanatorium		Unit of Arkansas Tuberculosis Sanatorium, State Sanatorium					
St. Edward's Mercy Hosp.	Gen	Church	100	79	15	381	2,910
Sparks' Memorial Hosp.	Gen	NPAasn	100	37	12	208	2,025
Haskell, 180—Saline							
State Hospital, Benton Division		Unit of State Hospital, Little Rock					
Heber Springs, 1,401—Cleburne							
Estelle Hospital	Gen	Part	20	8	3	68	460
Helena, 8,316—Phillips							
Helena Hospital	Gen	NPAasn	38	20	6	66	887
Hope, 6,008—Hempstead							
Josephine Hospital	Gen	Part	22	5	4	37	320
Julia Chester Hospital	Gen	NPAasn	20	14	4	50	480
Hot Springs National Park, 20,238—Garland							
Army and Navy General Hospital	Gen	Fed	412	396	3	13	2,910
Leo N. Levl Memorial Hospital	Gen	Frat	75	55	5	40	1,313
Ozark Sanatorium	Gen	Corp	60	10	6	32	350
St. Joseph's Hospital	Gen	Church	144	80	6	83	2,357
Jonesboro, 10,326—Craighead							
St. Bernard's Hospital	Gen	Church	100	61	10	171	2,203
Lake Village, 1,582—Chicot							
Lake Village Infirmary	Gen	Part	33	14	4	57	819
Little Rock, 81,679—Pulaski							
Arkansas Children's Home and Hospital	Chil	NPAasn	83	50	..	..	947
Baptist State Hospital	Chil	Church	300	118	15	369	4,713
Granite Mountain Hospital. Gen		Indiv	19	4	2	10	134
Missouri Pacific Hospital ..	Indus	NPAasn	125	119	..	..	3,954
St. Vincent's Infirmary	Gen	Church	183	118	50	545	4,680
State Hospital	Ment	State	4,227	4,173	4	11	1,686
United Friends Hospital ..	Gen	Frat	25	10	6	1	236
University Hospital	Gen	State	240	82	30	163	2,552
Monticello, 3,076—Drew							
Mack Wilson Hospital	Gen	Indiv	30	11	..	21	492
Morrilton, 4,043—Conway							
St. Anthony's Hospital	Gen	Church	30	16	4	53	586
North Little Rock, 19,418—Pulaski							
Veterans Admin. Facility ..	Ment	Vet	1,300	1,154	..	..	837

ARKANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Paragould, 5,966—Greene							
Dickson Memorial Sanitarium	Gen	Corp	25	10	3	35	552
Pine Bluff, 20,760—Jefferson							
Davis Hospital	Gen	Church	57	26	4	223	1,215
Prescott, 3,033—Nevada							
Cora Donnell Hospital	Gen	Indiv	30	11	4	25	604
Russellville, 5,028—Pope							
St. Mary's Hospital	Gen	Indiv	60	25	12	87	1,254
Searcy, 3,387—White							
Wakenight Hospital	Gen	Indiv	35	19	4	36	1,167
Siloam Springs, 2,378—Benton							
John Brown Univ. Hospital	Gen	NPAasn	25	9	5	44	445
State Sanatorium, Logan							
Arkansas Tuberculosis Sanatorium	TB	State	1,150	687	..	..	1,032
Texarkana, 10,764—Miller							
Michael Meagher Memorial Hospital	Gen	Church	50	35	10	250	1,994
St. Louis Southwestern Hospital	Indus	NPAasn	150	79	..	..	3,045
Warren, 2,523—Bradley							
Hunt-Hope Hospital	Gen	Part	17	5	4	26	212

Related Institutions

De Queen, 2,938—Sevier							
Childress Hospital	Gen	Indiv	20	3	..	15	160
Hot Springs National Park, 20,238—Garland							
New Park Sanitarium and Hospital	Gen	Indiv	20	7	1	4	100
Public Health Service Medical Center Infirmary	Ven	USPHS	90	50	4	11	695
Little Rock, 81,679—Pulaski							
Arkansas School for the Blind	Inst	State	22	..	..	..	83
Florence Crittenton Home ..	Mat	NPAasn	34	1	14	24	54
Pulaski County Hospital	Gen	County	200	182	6	142	1,321
Newport, 4,547—Jackson							
Dr. Gray's Sanitarium	Gen	Indiv	9	4	1	11	165
Russellville, 5,028—Pope							
Haney Eye, Ear, Nose and Throat Hospital	ENT	Indiv	8	3	..	..	500

CALIFORNIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Agnew, 300—Santa Clara							
Agnew's State Hospital	Ment	State	3,525	3,500	..	..	963
Alhambra, 50—Madera							
Alhambra Tri-County Tuberculosis Sanatorium	TB	Counties	128	117	..	..	119
Alameda, 35,033—Alameda							
Alameda Hospital	Gen	NPAasn	75	38	21	232	1,876
Albany, 8,509—Alameda							
Albany Hospital	Gen	Indiv	30	19	16	381	973
Alhambra, 29,472—Los Angeles							
Alhambra Hospital	Gen	Corp	40	23	12	285	1,345
Angel Island, 478—Marin							
Station Hospital	Gen	Army	70	27	..	..	986
Antioch, 3,563—Contra Costa							
Antioch Hospital	Gen	Indiv	16	7	4	142	627
Arcata, 1,709—Humboldt							
Trinity Hospital	Gen	Church	25	11	5	134	450
Arlington, 3,440—Riverside							
Riverside County Hospital ..	GenTb	County	325	303	20	485	4,300
Artesia, 3,891—Los Angeles							
Artesia Hospital	Gen	Indiv	25	12	7	108	570
Auberry, 100—Fresno							
Wish-ah Sanatorium	TB	County	102	92	..	..	137
Auburn, 2,661—Placer							
Highland Hospital	Gen	Indiv	25	..	..	..	No data supplied
Bakersfield, 26,015—Kern							
Merced Hospital	Gen	Church	80	69	20	394	3,315
Banning, 2,752—Riverside							
Banning Hospital and Sanatorium	GenTb	Indiv	25	8	2	5	284
Belmont, 984—San Mateo							
Alexander Sanitarium	N&M	Corp	75	48	..	..	185
California Sanatorium	TB	Corp	100	77	..	..	168
Berkeley Hospital	Gen	Corp	45	36	..	..	94
Berkeley Hospital	Gen	Corp	100	77	36	509	3,457
E. V. Cowell Memorial Hospital ..	Gen	NPAasn	100	40	13	220	1,827
Brawley, 10,439—Imperial							
Brawley Community Hosp..	Gen	Indiv	25	12	9	169	574
Burbank, 16,662—Los Angeles							
Burbank Hospital	Gen	Indiv	36	18	12	180	841
Camarillo, 506—Ventura							
Camarillo State Hospital ..	Ment	State	2,591	2,258	..	..	1,110
Carmel, 2,200—Monterey							
Peninsula Community Hosp. Gen		NPAasn	35	21	9	163	829

CALIFORNIA—Continued

REGISTERED HOSPITALS

CALIFORNIA—Continued

June 1, 1934
March 1, 1934

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Units	Admission	Deeds	Average Census	Buildings	Number of Births	Admissions	Hospitals and Sanatoriums	Type of Service	Ownership or Control	Units	Admission	Deeds	Average Census	Buildings	Number of Births	Admissions
Chico, 7,961—Butte	Gen	Indiv	50	24	14	231	1,325			Loma Linda, 2,500—San Bernardino	Gen	Indiv	112	70	12	21	2		
Enloe Hospital	Gen	Indiv	50	24	14	231	1,325			Loma Linda Sanitarium and	Gen	Indiv	112	70	12	21	2		
Colfax, 912—Placer	Gen	Indiv	50	24	14	231	1,325			Hospital	Gen	Indiv	112	70	12	21	2		
Bushnell Sanatorium	Gen	Indiv	50	24	14	231	1,325			Long Beach, 142,032—Los Angeles	Gen	Indiv	112	70	12	21	2		
Colfax Hospital	Gen	Indiv	50	24	14	231	1,325			Harriman Jones Clinic and	Gen	Indiv	112	70	12	21	2		
Colfax School for the Tubercu-	Gen	Indiv	50	24	14	231	1,325			Hospital	Gen	Indiv	112	70	12	21	2		
culous	Gen	Indiv	50	24	14	231	1,325			Long Beach Community Hos-	Gen	Indiv	112	70	12	21	2		
Compton, 12,316—Los Angeles	Gen	Indiv	50	24	14	231	1,325			pital	Gen	Indiv	112	70	12	21	2		
Compton Sanitarium	Gen	Indiv	50	24	14	231	1,325			St. Mary's Long Beach Hos-	Gen	Indiv	112	70	12	21	2		
Las Campanas Hospital	Gen	Indiv	50	24	14	231	1,325			pital	Gen	Indiv	112	70	12	21	2		
Covina, 2,774—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Seaside Memorial Hospital	Gen	Indiv	112	70	12	21	2		
Crescent City, 1,720—Del Norte	Gen	Indiv	50	24	14	231	1,325			Los Angeles, 1,235,018—Los Angeles	Gen	Indiv	112	70	12	21	2		
Knapp Hospital	Gen	Indiv	50	24	14	231	1,325			Barlow Sanatorium	Gen	Indiv	112	70	12	21	2		
Culver City, 5,660—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Baurhyte Maternity	Gen	Indiv	112	70	12	21	2		
University Hospital	Gen	Indiv	50	24	14	231	1,325			California Babies' Cottage Mat-	Gen	Indiv	112	70	12	21	2		
Diablo, 2,908—Tulare	Gen	Indiv	50	24	14	231	1,325			ernity Hospital	Gen	Indiv	112	70	12	21	2		
Duarte, 1,500—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Cedars of Lebanon Hospital	Gen	Indiv	112	70	12	21	2		
Los Angeles Sanatorium	Gen	Indiv	50	24	14	231	1,325			Children's Hospital	Gen	Indiv	112	70	12	21	2		
Dunsmuir, 2,610—Siskiyou	Gen	Indiv	50	24	14	231	1,325			East Los Angeles Hospital	Gen	Indiv	112	70	12	21	2		
Dunsmuir Hospital and San-	Gen	Indiv	50	24	14	231	1,325			Ex-Patients Home of the	Gen	Indiv	112	70	12	21	2		
itarium	Gen	Indiv	50	24	14	231	1,325			Jewish Consumptive Relief	Gen	Indiv	112	70	12	21	2		
El Centro, 8,434—Imperial	Gen	Indiv	50	24	14	231	1,325			Association	Gen	Indiv	112	70	12	21	2		
Imperial County Farm and	Gen	Indiv	50	24	14	231	1,325			Eye and Ear Hospital	Gen	Indiv	112	70	12	21	2		
Hospital	Gen	Indiv	50	24	14	231	1,325			French Hospital	Gen	Indiv	112	70	12	21	2		
El Monte, 3,470—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Golden State Hospital	Gen	Indiv	112	70	12	21	2		
Ruth Home	Gen	Indiv	50	24	14	231	1,325			Hospital of the Good Sam-	Gen	Indiv	112	70	12	21	2		
Eureka, 15,752—Humboldt	Gen	Indiv	50	24	14	231	1,325			aritan	Gen	Indiv	112	70	12	21	2		
General Hospital	Gen	Indiv	50	24	14	231	1,325			Japanese Hospital	Gen	Indiv	112	70	12	21	2		
Humboldt Hospital	Gen	Indiv	50	24	14	231	1,325			Lincoln Hospital	Gen	Indiv	112	70	12	21	2		
Humboldt County School for	Gen	Indiv	50	24	14	231	1,325			Los Angeles County Hospi-	Gen	Indiv	112	70	12	21	2		
the Tuberculous	Gen	Indiv	50	24	14	231	1,325			tal (Medical Unit)	Gen	Indiv	112	70	12	21	2		
St. Joseph Hospital	Gen	Indiv	50	24	14	231	1,325			Los Angeles County Psy-	Gen	Indiv	112	70	12	21	2		
Fort Bragg, 3,022—Mendocino	Gen	Indiv	50	24	14	231	1,325			chopathic Hospital	Gen	Indiv	112	70	12	21	2		
Redwood Const Hospital	Gen	Indiv	50	24	14	231	1,325			Los Angeles Sanitarium	Gen	Indiv	112	70	12	21	2		
French Camp, 248—San Joaquin	Gen	Indiv	50	24	14	231	1,325			Methodist Hospital of South-	Gen	Indiv	112	70	12	21	2		
San Joaquin General Hosp.	Gen	Indiv	50	24	14	231	1,325			ern California	Gen	Indiv	112	70	12	21	2		
Burnett Sanitarium	Gen	Indiv	50	24	14	231	1,325			Orthopaedic Hospital	Gen	Indiv	112	70	12	21	2		
General Hospital of Fresno	Gen	Indiv	50	24	14	231	1,325			Pahl Hospital	Gen	Indiv	112	70	12	21	2		
County	Gen	Indiv	50	24	14	231	1,325			Presbyterian Hospital—Olm-	Gen	Indiv	112	70	12	21	2		
St. Agnes Hospital	Gen	Indiv	50	24	14	231	1,325			sted Memorial	Gen	Indiv	112	70	12	21	2		
Fullerton, 10,500—Orange	Gen	Indiv	50	24	14	231	1,325			Queen of Angeles Hosp.	Gen	Indiv	112	70	12	21	2		
Fullerton Hospital	Gen	Indiv	50	24	14	231	1,325			Santa Fe Coast Lines Hos-	Gen	Indiv	112	70	12	21	2		
Gilroy, 3,502—Santa Clara	Gen	Indiv	50	24	14	231	1,325			pital	Gen	Indiv	112	70	12	21	2		
Wheeler Hospital	Gen	Indiv	50	24	14	231	1,325			Southwest General Hospital	Gen	Indiv	112	70	12	21	2		
Glendale, 62,736—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Madera, 4,665—Madera	Gen	Indiv	112	70	12	21	2		
Glendale Sanitarium and	Gen	Indiv	50	24	14	231	1,325			Dearborn Hospital	Gen	Indiv	112	70	12	21	2		
Physicians and Surgeons	Gen	Indiv	50	24	14	231	1,325			Madera Hospital	Gen	Indiv	112	70	12	21	2		
Hospital	Gen	Indiv	50	24	14	231	1,325			Madera Sanitarium	Gen	Indiv	112	70	12	21	2		
Grass Valley, 3,517—Nevada	Gen	Indiv	50	24	14	231	1,325			Manor, —Marin	Gen	Indiv	112	70	12	21	2		
Hanford, 7,028—Kings	Gen	Indiv	50	24	14	231	1,325			Archbishop Sanatorium	Gen	Indiv	112	70	12	21	2		
Hanford Sanitarium	Gen	Indiv	50	24	14	231	1,325			Station Field, —Riverside	Gen	Indiv	112	70	12	21	2		
Sacred Heart Hospital	Gen	Indiv	50	24	14	231	1,325			Mare Island, 500—Solano	Gen	Indiv	112	70	12	21	2		
Hawthorne, 6,376—Los Angeles	Gen	Indiv	50	24	14	231	1,325			U. S. Naval Hospital	Gen	Indiv	112	70	12	21	2		
Hawthorne Hospital	Gen	Indiv	50	24	14	231	1,325			Martinez, 6,500—Contra Costa	Gen	Indiv	112	70	12	21	2		
Hayward, 5,330—Alameda	Gen	Indiv	50	24	14	231	1,325			Contra Costa County Hosp. Gen	Gen	Indiv	112	70	12	21	2		
Hayward Hospital	Gen	Indiv	50	24	14	231	1,325			Martinez Community Hosp. Gen	Gen	Indiv	112	70	12	21	2		
Healdsburg, 2,206—Sonoma	Gen	Indiv	50	24	14	231	1,325			McCloud, 2,610—Siskiyou	Gen	Indiv	112	70	12	21	2		
Healdsburg General Hosp.	Gen	Indiv	50	24	14	231	1,325			Merced, 7,000—Merced	Gen	Indiv	112	70	12	21	2		
Hermosa Beach, 4,700—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Modesto, 13,842—Stanislaus	Gen	Indiv	112	70	12	21	2		
South Bay Community Hosp. Gen	Gen	Indiv	50	24	14	231	1,325			McPeckers Hospital	Gen	Indiv	112	70	12	21	2		
Hollister, 3,757—San Benito	Gen	Indiv	50	24	14	231	1,325			Robertson Hospital	Gen	Indiv	112	70	12	21	2		
Hazel Hawkins Memorial	Gen	Indiv	50	24	14	231	1,325			St. Mary's Hospital	Gen	Indiv	112	70	12	21	2		
Hospital	Gen	Indiv	50	24	14	231	1,325			Stanislaus County Hospital	Gen	Indiv	112	70	12	21	2		
Hoopa, 20—Humboldt	Gen	Indiv	50	24	14	231	1,325			Monrovia, 10,800—Los Angeles	Gen	Indiv	112	70	12	21	2		
Hoopa Valley Indian Hosp. Gen	Gen	Indiv	50	24	14	231	1,325			Northridge Sanatorium and	Gen	Indiv	112	70	12	21	2		
Huntington Park, 24,501—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Clinic	Gen	Indiv	112	70	12	21	2		
Mission Hospital	Gen	Indiv	50	24	14	231	1,325			Monterey, 9,111—Monterey	Gen	Indiv	112	70	12	21	2		
Imola, 20—Napa	Gen	Indiv	50	24	14	231	1,325			Station Hospital	Gen	Indiv	112	70	12	21	2		
Napa State Hospital	Gen	Indiv	50	24	14	231	1,325			Monterey Hospital	Gen	Indiv	112	70	12	21	2		
Indio, 2,000—Riverside	Gen	Indiv	50	24	14	231	1,325			Garfield Hospital	Gen	Indiv	112	70	12	21	2		
Coachella Valley	Gen	Indiv	50	24	14	231	1,325			Murphy, 6,000—Calaveras	Gen	Indiv	112	70	12	21	2		
Inglewood, 19,480—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Bret Harte Sanatorium	Gen	Indiv	112	70	12	21	2		
Centinela Hospital	Gen	Indiv	50	24	14	231	1,325			Napa, 6,457—Napa	Gen	Indiv	112	70	12	21	2		
Keene, 164—Kern	Gen	Indiv	50	24	14	231	1,325			Victory Hospital	Gen	Indiv	112	70	12	21	2		
Stony Brook Retreat	Gen	Indiv	50	24	14	231	1,325			National City, 7,501—San Diego	Gen	Indiv	112	70	12	21	2		
Community Hospital	Gen	Indiv	50	24	14	231	1,325			Elwyn Hospital	Gen	Indiv	112	70	12	21	2		
La Crescenta, 6,000—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Paradise Valley Sanitarium	Gen	Indiv	112	70	12	21	2		
Hillcrest Sanatorium	Gen	Indiv	50	24	14	231	1,325			and Hospital	Gen	Indiv	112	70	12	21	2		
La Vina, 70—Los Angeles	Gen	Indiv	50	24	14	231	1,325			Wildwood Sanatorium	Gen	Indiv	112	70	12	21	2		
La Vina Sanatorium	Gen	Indiv	50	24	14	231	1,325			Newman, 1,323—Stanislaus	Gen	Indiv	112	70	12	21	2		
Lindsay, 3,872—Tulare	Gen	Indiv	50	24	14														

CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Providence Hospital* ^{AO}	Gen	Church	190	90	30	754	4,803
Samuel Merritt Hospital* ^{AO}	Gen	NPAasn	168	138	36	856	5,655
Olive View, —Los Angeles							
Olive View Sanatorium* ⁺	TB	County	1,017	1,003	..	...	756
Orange, 8,006—Orange							
Orange County Hospital* ^{AO}	Gen	County	362	300	16	372	3,584
St. Joseph Hospital* ^{AO}	Gen	Church	105	70	21	335	2,481
Oxnard, 6,285—Ventura							
St. John's Hospital* ^{AO}	Gen	Church	27	16	9	156	720
Palo Alto, 13,652—Santa Clara							
Palo Alto Hospital.....	Gen	NPAasn	80	67	20	400	2,157
Veterans Admin. Facility* ⁺	Ment	Vet	1,149	1,101	..	...	319
Pasadena, 76,086—Los Angeles							
Collis P. and Howard Hunt- ington Memorial Hosp* ^{AO}	Gen	NPAasn	174	132	24	576	5,850
Las Encinas Sanitarium.....	Nerv & IntMed	Corp	100	87	..	...	298
Lutheran Good Samaritan Hospital.....	Gen	Church	40	26	12	77	510
St. Luke Hospital* ^{AO}	Gen	Church	75	53	20	329	2,027
Southern California San- itarium for Nervous and General Diseases.....	See Las Encinas Sanitarium						
Woman's Hospital.....	Mat	NPAasn	14	9	14	300	316
Patton, 4,100—San Bernardino							
Patton State Hospital.....	Ment	State	3,923	3,714	..	...	1,310
Placerville, 2,322—Eldorado							
Placerville Sanatorium.....	Gen	Part	30	14	8	69	537
Pomona, 20,804—Los Angeles							
Pomona Valley Community Hospital* ^{AO}	Gen	NPAasn	82	25	21	214	1,157
Portola, 1,400—Plumas							
Western Pacific Railway Hospital.....	Gen	NPAasn	27	12	6	81	501
Red Bluff, 3,517—Tehama							
St. Elizabeth's Mercy Hosp..	Gen	Church	38	20	8	124	400
Tehama County Hospital.....	Gen	County	45	45	6	58	509
Redwood City, 8,962—San Mateo							
Canyon Sanatorium.....	TB	Indiv	70	28	..	...	69
Hassler Health Home.....	TB	CyCo	111	100	..	...	141
Richmond, 20,093—Contra Costa							
Richmond Hospital* ^{AO}	Gen	Part	50	33	14	257	1,090
Riverside, 29,696—Riverside							
Riverside Community Hosp.* ^{AO}	Gen	NPAasn	64	50	18	325	1,960
Rosemead, 4,500—Los Angeles							
Alhambra Sanatorium.....	N&M	Indiv	22	19	..	...	122
Ross, 1,355—Marin							
Ross General Hospital* ^{AO}	Gen	Corp	90	53	8	144	1,215
Sacramento, 93,750—Sacramento							
Mersey Hospital* ^{AO}	Gen	Church	152	104	27	536	4,365
Sacramento County Hos- pital* ^{AO}	Gen	County	475	460	25	715	8,821
Sutter General Hospital* ^{AO}	Gen	NPAasn	217	168	..	...	7,544
Sutter Maternity Hospital..	Mat	NPAasn	52	33	52	1,186	1,358
Salinas, 10,263—Monterey							
El Sausal Sanitarium.....	Unit of Monterey County Hospital						
Monterey County Hospital..	GenTb	County	103	175	8	276	2,717
Park Lane Hospital.....	Gen	Indiv	26	10	9	218	1,061
Salinas Valley Hospital.....	Gen	Part	23	12	9	150	1,025
San Bernardino, 37,481—San Bernardino							
San Bernardino's Hospital* ^{AO}	Gen	Church	125	47	12	333	1,720
San Bernardino County Charity Hospital* ^{AO}	Gen	County	340	293	17	498	3,895
San Diego, 147,993—San Diego							
Mersey Hospital* ^{AO}	Gen	Church	325	252	69	1,963	10,934
San Diego County General Hospital* ^{AO}	Gen	County	664	472	32	902	9,354
Scripps Memorial Hospital* ^{AO}	Gen	NPAasn	44	29	6	87	996
Scripps Metabolic Clinic.....	Metab	NPAasn	33	25	..	...	1,276
U. S. Naval Hospital* ^{AO}	Gen	Navy	1,000	837	..	...	6,592
Vauelein Home.....	Unit of San Diego County Gen'l Hospital						
San Fernando, 7,567—Los Angeles							
Veterans Admin. Facility* ⁺	TB	Vet	330	272	..	...	471
San Francisco, 634,394—San Francisco							
Chinese Hospital.....	Gen	NPAasn	50	15	8	87	536
Dante Hospital.....	Gen	Corp	173	96	10	124	4,178
Franklin Hospital* ^{AO}	Gen	NPAasn	220	178	21	455	5,264
French Hospital* ^{AO}	Gen	Frat	210	176	10	229	3,729
Golden Gate International Exposition Hospital.....	Emerg	NPAasn	12	...	...	...	1,630
Greens' Eye Hospital* ^{AO}	ENT	Part	33	16	..	...	1,043
Hospital for Children* ^{AO}	Gen	NPAasn	188	126	44	1,075	5,854
Letterman General Hosp.* ^{AO}	Gen	Army	600	609	10	133	7,089
Mary's Help Hospital* ^{AO}	Gen	Church	117	87	25	600	3,345
Mt. Zion Hospital* ^{AO}	Gen	NPAasn	163	110	26	379	3,984
Park Sanitarium.....	N&M	Corp	33	22	..	...	681
St. Elizabeth's Infant Hosp.	MatCh	Church	65	57	10	67	101
St. Francis Hospital* ^{AO}	Gen	NPAasn	300	178	63	715	7,847
St. Joseph's Hospital* ^{AO}	Gen	Church	236	180	36	942	8,005
St. Luke's Hospital* ^{AO}	Gen	Church	200	150	25	393	5,191
St. Mary's Hospital* ^{AO}	Gen	Church	255	235	40	1,071	10,255
San Francisco Hospital* ^{AO}	Gen	CyCo	1,263	1,074	45	748	15,505
San Francisco Psychopathic Hospital.....	Unit of San Francisco Hospital						
Shriners Hospital for Crip- pled Children* ^{AO}	Orth	Frat	60	60	..	...	294
Southern Pacific General Hospital* ^{AO}	Indus	NPAasn	400	324	..	...	5,340

CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Stanford University Hos- pitals* ^{AO}	Gen	NPAasn	298	238	26	602	9,037
Sutter Hospital.....	Gen	Corp	60	33	12	36	2,419
U. S. Marine Hospital* ^{AO}	Gen	USPHS	478	391	..	...	4,647
University of California Hospital* ^{AO}	Gen	State	273	205	30	533	7,286
Veterans Admin. Facility* ⁺	Gen	Vet	336	313	..	...	2,510
Sanger, 2,967—Fresno							
Sanger Sanitarium.....	Gen	Indiv	16	8	3	79	455
Sanitarium, 500—Napa							
St. Helena Sanitarium and Hospital* ^{AO}	Gen	Church	130	69	6	100	2,072
San Jacinto, 1,346—Riverside							
Soboba Indian Hospital.....	Gen	IA	34	23	3	36	248
San Jose, 57,651—Santa Clara							
Alum Rock Sanatorium.....	TB	Corp	45	40	..	...	122
O'Connor Sanitarium* ^{AO}	Gen	Church	105	85	25	581	3,107
San Jose Hospital* ^{AO}	Gen	NPAasn	131	86	30	692	3,784
Santa Clara County Hospi- tal* ^{AO}	Gen	County	518	443	29	756	7,882
Santa Clara County Sana- torium.....	Unit of Santa Clara County Hospital						
San Leandro, 11,455—Alameda							
Fairmont Hospital of Ala- meda County* ^{AO}	GenTb	County	785	787	..	...	1,567
San Luis Obispo, 8,276—San Luis Obispo							
Mountain View Hospital.....	Gen	Indiv	25	18	4	76	697
San Luis Obispo County Tu- berculosis Sanatorium.....	Unit of San Luis Obispo General Hospital						
San Luis Obispo General Hospital.....	GenTb	County	100	66	8	103	1,698
San Luis Sanitarium.....	Gen	Indiv	23	14	7	70	683
San Mateo, 13,444—San Mateo							
Community Hospital of San Mateo County* ^{AO}	Gen	County	192	137	12	170	2,122
Mills Memorial Hospital* ^{AO}	Gen	Church	131	68	29	332	2,227
San Pedro, —Los Angeles							
San Pedro Hospital* ^{AO}	Gen	Corp	88	54	22	464	2,154
Station Hospital.....	Gen	Army	31	23	..	...	821
U. S. Ship Relief Hospital* ^{AO}	Gen	Navy	367	117	..	...	2,006
San Rafael, 8,022—Marin							
San Rafael Cottage Hosp..	Gen	Indiv	40	25	15	210	1,061
Station Hospital.....	Gen	Army	30	20	..	...	588
Santa Barbara, 33,613—Santa Barbara							
St. Francis Hospital* ^{AO}	Gen	Church	85	50	15	224	1,818
Santa Barbara Cottage Hos- pital* ^{AO}	Gen	NPAasn	183	102	18	234	3,236
Santa Barbara General Hos- pital* ^{AO}	Gen	County	285	194	12	229	2,632
Santa Cruz, 14,395—Santa Cruz							
Hanly Hospital.....	Gen	Indiv	31	10	10	58	463
Santa Cruz County Hospital	GenTb	County	110	132	6	122	1,420
Santa Cruz Hospital.....	Gen	Corp	35	17	8	169	1,030
Santa Monica, 37,146—Los Angeles							
St. Catherine's Hospital.....	GenChr	Part	55	50	8	67	265
Santa Monica Hospital* ^{AO}	Gen	Corp	150	115	30	1,002	5,289
Santa Rosa, 10,636—Sonoma							
Eliza Tanner Hospital.....	Gen	Part	20	10	5	127	510
General Hospital.....	Gen	Indiv	35	17	8	99	998
Sonoma County Hospital..	Gen	County	416	325	16	279	2,906
Scotia, 1,000—Humboldt							
Scotia Hospital.....	Gen	NPAasn	35	16	4	28	313
Selma, 3,047—Fresno							
Selma Sanitarium.....	Gen	Corp	21	14	5	111	1,032
Shasta Dam, 750—Shasta							
Shasta Dam Hospital.....	Gen	Corp	28	9	..	...	376
Sonoma, 2,278—Toulumne							
Sonoma Hospital.....	Gen	Indiv	25	13	4	55	571
South Gate, 19,632—Los Angeles							
Suburban Hospital.....	Gen	NPAasn	46	38	20	645	1,414
South Pasadena, 13,736—Los Angeles							
Pasadena Sanitarium.....	N&M	Indiv	100	71	..	...	85
South San Francisco, 6,193—San Mateo							
South San Francisco Hosp..	Gen	Corp	34	11	6	62	618
Spadra, 275—Los Angeles							
Pacific Colony-State Nar- cotic Hospital.....	McDeDrug State		1,106	972	..	...	157
Springville, 665—Tulare							
Tulare-Kings Counties Joint Tuberculosis Hospital.....	TB	Counties	158	128	..	...	126
Stockton, 47,963—San Joaquin							
Dameron Hospital.....	Gen	Corp	77	62	18	408	2,646
St. Joseph's Home and Hos- pital* ^{AO}	Gen	Church	95	53	15	374	2,183
Stockton State Hospital.....	Ment	State	4,038	4,038	..	...	1,415
Susanville, 1,335—Lassen							
Riverside Hospital.....	Gen	Indiv	40	6	5	38	584
Talmage, 350—Mendocino							
Mendocino State Hospital* ⁺	Ment	State	2,544	3,029	..	...	739
Tehachapi, 736—Kern							
Tehachapi Valley Hospital..	Gen	Indiv	15	7	4	35	363
Terminal Island, 1,046—Los Angeles							
Federal Correctional Hosp.* ^{AO}	Gen	USPHS	41	35	..	...	441
Torrance, 7,271—Los Angeles							
Jared Sidney Torrance Me- morial Hospital* ^{AO}	Gen	NPAasn	37	30	12	379	1,133
Trona, 775—San Bernardino							
Trona Hospital.....	Gen	NPAasn	20	6	7	29	505

Key to symbols and abbreviations is on page 1195

CALIFORNIA—Continued

REGISTERED HOSPITALS

Hospitals and Sanatoriums

	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Tulare, 6,207—Tulare	Gen	County	100	75	15	511	3,159
Tulare County Gen. Hosp.	Gen	County	23	18	4	118	863
Turlock, 4,276—Stanislaus	Gen	County	40	19	7	136	763
Emanuel Hospital	Gen	Church	16	5	6	38	273
Lillian Collins Hospital	Gen	Church	55	28	12	177	1,224
San Antonio Community Hospital	Gen	NPAssn	70	25	15	285	1,000
Vallejo, 14,476—Solano	Gen	NPAssn	65	23	12	163	1,262
Vallejo General Hospital	Gen	NPAssn	300	182	8	260	4,124
Ventura, 11,603—Ventura	Gen	NPAssn	15	4	2	26	300
Bard Memorial Hospital	Gen	NPAssn	34	19	14	260	1,128
Foster Memorial Hospital	Gen	NPAssn	37	24	10	150	896
Ventura County Hospital	Gen	NPAssn	24	8	4	84	380
Vineburg, 164—Sonoma	Gen	NPAssn	2,420	1,802	...	...	8,248
Burndale Hospital	Gen	NPAssn	35	14	6	129	601
Visalia, 7,263—Tulare	Gen	NPAssn	23	16	5	66	638
Visalia Municipal Hospital	Gen	NPAssn	65	40	10	133	1,623
Watsonville, 8,344—Santa Cruz	Gen	NPAssn	14	6	2	18	368
Watsonville Hospital	Gen	NPAssn	140	130	7	121	1,456
Weed, 4,000—Siskiyou	Gen	NPAssn	20	15	6	215	1,024
Weed Hospital	Gen	NPAssn	23	15	...	...	178
Weimar, 50—Placer	Gen	NPAssn	25	14	...	...	14
Weimar Joint Sanatorium	Gen	NPAssn	35	35	...	...	47
West Los Angeles, —Los Angeles	Gen	NPAssn	132	96	5	84	2,142
Veterans Admin. Facility	Gen	NPAssn	80	70	...	...	251
Westwood, 3,700—Lassen	Gen	NPAssn	20	17	...	...	46
Westwood Hospital	Gen	NPAssn	13	3	...	...	60
Willits, 1,424—Mendocino	Gen	NPAssn	19	8	11	69	324
Frank R. Howard Memorial Hospital	Gen	NPAssn	14	3	...	...	310
Woodland, 5,542—Yolo	Gen	NPAssn	12	6	5	56	334
Woodland Clinic Hospital	Gen	NPAssn	17	7	4	132	335
Yosemite National Park, 1,000—Mariposa	Gen	NPAssn	16	6	3	55	392
Lewis Memorial Hospital	Gen	NPAssn	24	14	...	...	410
Siskiyou County General Hospital	Gen	NPAssn	100	100	...	...	125
Yuba City, 3,605—Sutter	Gen	NPAssn	2,742	2,859	...	...	401
Yuba City General Hospital	Gen	NPAssn	16	5	...	...	134

Related Institutions

Alcatraz, —San Francisco	Inst	Fed	23	15	...	...	178
C. S. Penitentiary Hosp.	Inst	Fed	25	14	...	...	14
Alta Loma, 1,500—San Bernardino	Inst	Fed	35	35	...	...	47
Our Lady of Lourdes Sanatorium	Inst	Fed	132	96	5	84	2,142
Artesia, 3,691—Los Angeles	Inst	Fed	80	70	...	...	251
Pioneer Sanatorium	Inst	Fed	20	17	...	...	46
Atwater, 917—Merced	Inst	Fed	13	3	...	...	60
Bloss Memorial Hospital	Inst	Fed	19	8	11	69	324
Auburn, 2,601—Placer	Inst	Fed	14	3	...	...	310
Placer County Hospital	Inst	Fed	12	6	5	56	334
Azusa, 4,608—Los Angeles	Inst	Fed	17	7	4	132	335
Rural Rest Home and Sanatorium	Inst	Fed	16	6	3	55	392
Bloomington, 84—San Mateo	Inst	Fed	24	14	...	...	410
Chas. S. Howard Foundation	Inst	Fed	100	100	...	...	125
Hillwell Sanatorium	Inst	Fed	2,742	2,859	...	...	401
Monop, 1,150—Inyo	Inst	Fed	16	5	...	...	134
Monop Basia Hospital	Inst	Fed	6	3	3	32	205
Blythe, 1,620—Riverside	Inst	Fed	40	22	3	12	220
Blythe Hospital	Inst	Fed	150	140	...	...	2,669
Claremont, 2,719—Los Angeles	Inst	Fed	14	8	17	261	247
Claremont Colleges Infirm.	Inst	Fed	44	28	...	...	270
Coronado, 5,425—San Diego	Inst	Fed	12	7	4	52	343
Coronado Hospital	Inst	Fed	...	...	...	...	...
Delano, 3,000—Los Angeles	Inst	Fed	...	...	...	...	...
Delano Hospital	Inst	Fed	...	...	...	...	...
Dos Palos, 1,600—Merced	Inst	Fed	...	...	...	...	...
Dos Palos Community Hosp.	Inst	Fed	...	...	...	...	...
Duarte, 1,500—Los Angeles	Inst	Fed	...	...	...	...	...
Mulrose Sanatorium	Inst	Fed	...	...	...	...	...
Santa Teresa Sanatorium	Inst	Fed	...	...	...	...	...
Eldridge, 16—Sonoma	Inst	Fed	...	...	...	...	...
Sonoma State Home	Inst	Fed	...	...	...	...	...
Eureka, 13,752—Humboldt	Inst	Fed	...	...	...	...	...
Humboldt County Isolation Hospital	Inst	Fed	...	...	...	...	...
Fowler, 1,171—Fresno	Inst	Fed	...	...	...	...	...
Fowler Sanatorium	Inst	Fed	...	...	...	...	...
Glendale, 62,557—Los Angeles	Inst	Fed	...	...	...	...	...
Villa Shaw Rest Home	Inst	Fed	...	...	...	...	...
Hollister, 5,757—San Benito	Inst	Fed	...	...	...	...	...
San Benito County Hosp.	Inst	Fed	...	...	...	...	...
Hondo, 3,150—Los Angeles	Inst	Fed	...	...	...	...	...
Rancho Los Amigos	Inst	Fed	...	...	...	...	...
Inglewood, 19,400—Los Angeles	Inst	Fed	...	...	...	...	...
St. Ernie Sanatorium	Inst	Fed	...	...	...	...	...
Stork's Nest Maternity Hos.	Inst	Fed	...	...	...	...	...
Kern, 164—Kern	Inst	Fed	...	...	...	...	...
Kern County Preventorium	Inst	Fed	...	...	...	...	...
Kingsburg, 4,222—Fresno	Inst	Fed	...	...	...	...	...
Kingsburg Sanatorium	Inst	Fed	...	...	...	...	...

Key to symbols and abbreviations is on page 1195

CALIFORNIA—Continued

Joz. A. M. L.
March 24, 1934

Related Institutions

	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
La Crescenta, 6,000—Los Angeles	N&M	Part	23	21	...	...	...
Kimball Sanatorium	N&M	Part	118	110	...	...	...
Lancaster, 1,000—Los Angeles	N&M	Part	15	9	...	...	...
Antelope Valley Sanatorium	N&M	Part	20	14	21	49	14
Lincoln, 2,004—Placer	N&M	Part	22	11	...	...	...
Joslin's Sanatorium	N&M	Part	14	11	...	...	...
Livermore, 3,119—Alameda	N&M	Part	121	68	...	...	...
Del Valle Preventorium	N&M	Part	20	19	...	...	...
Long Beach, 12,032—Los Angeles	N&M	Part	56	50	...	...	...
Bixby Knolls Maternity Hosp.	N&M	Part	40	21	...	...	...
Los Angeles, 1,235,048—Los Angeles	N&M	Part	15	10	...	...	...
Chase Diet Sanatorium	N&M	Part	24	21	...	...	...
Doughty Sanatorium	N&M	Part	121	68	...	...	...
Florence Crittenton Home	N&M	Part	20	19	...	...	...
Junior League Home	N&M	Part	56	50	...	...	...
Home for Children	N&M	Part	40	21	...	...	...
Juvenile Hall Hospital	N&M	Part	15	10	...	...	...
Las Palmas Rest Home	N&M	Part	92	70	8	129	57
Mt. Sinai Hosp. and Clinic	N&M	Part	45	41	...	...	...
Resthaven	N&M	Part	7	3	4	20	14
St. Barnabas Rest Home for Men	N&M	Part	90	64	6	123	1,024
Salvation Army Women's Home and Hospital	N&M	Part	250	258	19	411	4,607
Twentieth Century Sanit.	N&M	Part	40	47	...	...	...
Manteca, 1,614—San Joaquin	N&M	Part	90	77	...	...	...
Manteca Hospital	N&M	Part	45	43	...	...	...
Marysville, 5,763—Yuba	N&M	Part	42	30	...	...	...
Yuba County Hospital	N&M	Part	25	22	...	...	...
Merced, 7,066—Merced	N&M	Part	11	5	8	132	53
Merced General Hospital	N&M	Part	100	71	...	...	...
Monrovia, 10,800—Los Angeles	N&M	Part	60	61	38	138	1,456
Maryknoll Sanatorium	N&M	Part	13	3	4	37	14
Palm Grove Health Camp	N&M	Part	60	30	...	...	...
Montebello, 5,498—Los Angeles	N&M	Part	40	23	...	...	...
Los Angeles Convalescent Home	N&M	Part	54	40	4	15	10
National City, 7,301—San Diego	N&M	Part	10	5	4	23	42
Hillcrest Home	N&M	Part	77	67	10	101	1,124
Nevada City, 1,701—Nevada	N&M	Part	89	80	...	...	...
Nevada City Sanatorium	N&M	Part	58	7	...	...	...
Nevada County Hospital	N&M	Part	68	32	...	...	...
Salvation Army Women's Home and Hospital	N&M	Part	37	23	...	...	...
Pacific Grove, 5,558—Monterey	N&M	Part	8	2	2	15	64
Pine Grove Sanatorium and Hospital	N&M	Part	25	15	...	...	...
Pacifica, —Los Angeles	N&M	Part	10	8	...	...	...
Independent Order of Foresters California of Tubercu-	N&M	Part	56	50	...	...	...
Islands Sanatorium	N&M	Part	20	12	6	101	417
Pasadena, 76,056—Los Angeles	N&M	Part	67	66	...	...	...
Pasadena Preventorium	N&M	Part	770	753	...	...	...
Eldorado, 2,322—Eldorado	N&M	Part	12	7	...	...	...
Randsburg, 433—Kern	N&M	Part	85	85	...	...	...
Rand District Hospital	N&M	Part	65	55	...	...	...
Redding, 4,188—Shasta	N&M	Part	12	7	...	...	...
Shasta County Hospital	N&M	Part	85	85	...	...	...
Repressa, 30—Sacramento	N&M	Part	12	7	...	...	...
Folsom Prison Hospital	N&M	Part	12	7	...	...	...
Riverside, 29,606—Riverside	N&M	Part	12	7	...	...	...
Sherman Institute	N&M	Part	12	7	...	...	...
Rosemead, 4,500—Los Angeles	N&M	Part	12	7	...	...	...
Rosemead Lodge	N&M	Part	12	7	...	...	...
Ross, 1,355—Marin	N&M	Part	12	7	...	...	...
Cedars Development School	N&M	Part	12	7	...	...	...
San Andreas, 1,032—Calaveras	N&M	Part	12	7	...	...	...
San Andreas Hospital	N&M	Part	12	7	...	...	...
Fraser Hall	N&M	Part	12	7	...	...	...
Lane Sanatorium	N&M	Part	12	7	...	...	...
San Fernando, 7,567—Los Angeles	N&M	Part	12	7	...	...	...
Pauling Rest Home	N&M	Part	12	7	...	...	...
San Fernando Hospital	N&M	Part	12	7	...	...	...
Garden Nursing Home	N&M	Part	12	7	...	...	...
Greer Home	N&M	Part	12	7	...	...	...
Laguna Honda Home Infirm.	N&M	Part	12	7	...	...	...
San Francisco Polytechnic	N&M	Part	12	7	...	...	...
San Gabriel, 7,224—Los Angeles	N&M	Part	12	7	...	...	...
Baldy View Sanatorium	N&M	Part	12	7	...	...	...
Mission Lodge Sanatorium	N&M	Part	12	7	...	...	...
San Jose, 57,651—Santa Clara	N&M	Part	12	7	...	...	...
Beale Sanatorium	N&M	Part	12	7	...	...	...
Sunnyholme Preventorium	N&M	Part	12	7	...	...	...
San Mateo, 13,444—San Mateo	N&M	Part	12	7	...	...	...
San Mateo Preventorium	N&M	Part	12	7	...	...	...
San Quentin, —Marin	N&M	Part	12	7	...	...	...
Charles L. Neumiller Hosp.	N&M	Part	12	7	...	...	...
San Rafael, 5,622—Marin	N&M	Part	12	7	...	...	...
Santa Clara County Hospital	N&M	Part	12	7	...	...	...
La Loma Feliz	N&M	Part	12	7	...	...	...

CALIFORNIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Santa Monica, 37,146—Los Angeles Loamshire Convalescent Hospital and Rest Home.....	Conv	Corp	22	9	..	..	166
Sonora, 2,276—Tuolumne Tuolumne County Hosp....	InstGen	County	33	23	5	52	515
Stanford University, 720—Santa Clara Stanford Convalescent Home Chil	NPAssn		80	70	..	..	197
Suisun City, 905—Solano Solano County Hospital...	InstGen	County	110	96	6	100	746
Sunland, —Los Angeles Sunland Sanatorium	TB	Corp	60	55	..	..	85
Verdugo City, 1,500—Los Angeles Rockhaven Sanatorium	N&M	Indiv	100	90	..	..	80
Veterans Home, 800—Napa Veterans Home HospitalA..	Inst	State	266	216	..	..	1,662
Willows, 2,024—Glenn Glenn County Hospital.....	InstGen	County	38	30	4	60	639
Yuba City, 3,605—Sutter Sutter County Hospital....	InstGen	County	70	44	8	157	997

COLORADO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Alamosa, 5,107—Alamosa Lutheran Hospital	Gen	Church	47	26	8	201	1,399
Aspen, 705—Pitkin Citizens' Hospital	Gen	NPAssn	20	6	2	3	50
Boulder, 11,223—Boulder Boulder-Colorado Sanitarium and HospitalA*o	Gen	Church	101	33	6	54	1,144
Community HospitalA.....	Gen	NPAssn	45	25	12	137	1,208
Brush, 2,312—Morgan Eben-Ezer Hospital	Gen	Church	24	12	8	78	545
Canon City, 5,938—Fremont Colorado Hospital	Gen	Indiv	97	6	4	45	396
Thomas More Hospital.....	Gen	Church	35	12	6	46	446
Chevenne Wells, 595—Chevenne Chevenne County Hospital. Gen	Indiv		10	3	5	35	226
Climax, 250—Lake Climax Molybdenum Company Hospital	Gen	NPAssn	10	6	..	..	210
Colorado Springs, 33,237—El Paso Beth-El General Hospital and SanatoriumA*o	GenTb	Church	202	96	15	425	2,245
Colorado Springs Psychopathic Hospital	N&M	Part	150	130	..	..	295
Glockner Sanatorium and HospitalA	GenTb	Church	150	96	13	149	1,585
National Methodist Episcopal Sanat. for Tuberculosis.....	Unit of Beth-El	Gen. Hosp. and Sanat.					
Observation Hospital.....	Unit of Beth-El	Gen. Hosp. and Sanat.					
St. Francis Hospital and SanatoriumA	GenTb	Church	150	81	11	231	1,642
Union Printers Home and Tuberculosis Sanatorium..	GenTb	NPAssn	172	163	..	..	210
Cortez, 921—Montezuma Johnson Hospital	Gen	Indiv	14	7	2	34	446
Cripple Creek, 1,427—Teller Cripple Creek Hospital.....	Gen	NPAssn	25	4	6	43	515
Del Norte, 1,410—Rio Grande St. Joseph's Hospital and Sanatorium	Gen	Church	35	21	11	96	708
Delta, 2,938—Delta Western Slope Memorial Hospital	Gen	NPAssn	11	5	3	15	204
Denver, 287,861—Denver Bethesda Sanatorium	TB	Church	68	35	..	..	42
Beth Israel HospitalA.....	Gen	NPAssn	55	28	10	43	1,197
Childrens HospitalA*o	Chil	NPAssn	200	126	..	..	3,589
Colorado General Hosp.*A*o Gen	State		245	137	20	549	3,763
Colorado Psychopathic HospitalA*o	Ment	State	781	74	..	..	899
Denver General Hosp.*A*o.. Gen	CyCo		521	328	51	569	7,763
Ex-Patients' Tubercular Home	TB	NPAssn	81	47	..	..	65
Fitzsimons General Hosp.A. GenTb	Army		1,185	910	6	71	5,497
Mersey HospitalA*o	Gen	Church	210	150	25	562	6,632
Mt. Airy SanitariumA.....	N&M	Corp	66	42	..	..	371
National Jewish HospitalA. TB	NPAssn		246	236	..	..	159
Porter Sanitarium and HospitalA	Gen	Church	100	47	14	260	1,481
Presbyterian HospitalA*o... Gen	Church		150	94	25	612	4,546
St. Anthony HospitalA*o... Gen	Church		154	101	30	634	5,146
St. Joseph's HospitalA*o... Gen	Church		244	192	30	707	5,333
St. Luke's HospitalA*o... Gen	Church		219	160	40	767	6,673
Sands House	TB	NPAssn	43	34	..	..	33
Steele Memorial Hospital... Iso	CyCo		80	31	..	..	819
Durango, 5,400—LaPlata Mersey HospitalA	Gen	Church	50	30	8	171	1,648
Edgewater, 1,473—Jefferson Craig Colony	TB	NPAssn	50	41	..	..	21
Englewood, 7,980—Arapahoe Swedish National Sanat.....	TB	NPAssn	90	55	..	..	74

COLORADO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Fairplay, 231—Park Fairplay Hospital	Gen	Indiv	14	8	2	30	524
Fort Logan, 800—Arapahoe Station Hospital	Gen	Army	65	46	..	..	1,434
Fort Lyon, 1,180—Bent Veterans Admin. FacilityA..	Ment	Vet	805	615	..	..	192
Fort Morgan, 4,423—Morgan Fort Morgan Hospital.....	Gen	Indiv	25	13	6	105	633
Glenwood Springs, 1,825—Garfield Dr. Porter's Hospital.....	Gen	Part	21	8	3	30	381
Grand Junction, 10,247—Mesa St. Mary's HospitalA*o.....	Gen	Church	65	35	12	191	998
Greeley, 12,203—Weld Greeley Hospital	Gen	County	108	66	26	510	3,311
Hayden, 554—Routt Solandt Memorial Hospital. Gen	NPAssn		15	8	3	43	319
Holyoke, 1,226—Phillips Holyoke Hospital	Gen	Indiv	8	5	2	4	252
Ignacio, 464—La Plata Edward T. Taylor Hospital Gen	IA		37	16	3	17	444
Julesburg, 1,467—Sedgwick Community Hospital	Gen	Indiv	10	5	4	33	205
La Junta, 7,193—Otero Atchison, Topeka and Santa Fe Railroad HospitalA.....	Indus	NPAssn	36	19	..	..	382
Mennonite Hospital and Sanitariumo	GenTb	Church	60	57	13	207	1,207
Lamar, 4,233—Prowers Charles Maxwell Hospital... Gen	Corp		50	12	6	62	476
Leadville, 3,771—Lake St. Vincent Hospital.....	Gen	Church	36	20	10	123	400
Longmont, 6,023—Boulder Longmont HospitalA	Gen	Indiv	33	17	7	81	779
Montrose, 3,566—Montrose Montrose Hospital	Gen	Indiv	20	5	5	41	291
St. Luke's Hospital.....	Gen	Indiv	16	7	3	74	374
Oak Creek, 1,211—Routt Oak Creek Hospital.....	Gen	Indiv	11	5	2	18	227
Ouray, 707—Ouray Bates Hospital and Sanit... Gen	Corp		16	8	2	6	431
Pueblo, 60,096—Pueblo Colorado State HospitalA..	Ment	State	3,9631	3,792	..	..	697
Corwin HospitalA*o	Gen	NPAssn	225	119	22	104	2,050
Parkview HospitalA*o	Gen	NPAssn	96	37	11	203	1,953
St. Mary HospitalA*o... Gen	Church		150	87	24	346	2,648
Woodcroft HospitalA	N&M	Corp	95	56	..	..	133
Rocky Ford, 3,426—Otero Physicians Hospital	Gen	NPAssn	10	8	3	43	397
Salida, 5,065—Chaffee Denver and Rio Grande Western Railroad Hosp.A..	Gen	NPAssn	80	44	4	86	1,309
Red Cross Hospital.....	Gen	Corp	40	15	3	24	463
Spivak, 350—Jefferson Sanatorium of the Jewish Consumptives' Relief SocietyA	TB	NPAssn	300	218	..	..	138
Sterling, 7,195—Logan Good Samaritan Hospital.. Gen	Church		20	16	10	124	799
St. Benedict HospitalA.....	Gen	Church	35	15	6	166	894
Towaoc, 50—Montezuma Mt. San Rafael Indian Hosp. Gen	IA		26	9	4	18	225
Trinidad, 11,732—Las Animas Mt. San Rafael Hospitalo.. Gen	Church		70	34	7	132	1,010
Walsenburg, 5,503—Huerfano Lamme Brothers Hospital.. Gen	Part		20	8	3	24	361
Wheat Ridge, 500—Jefferson Evangelical Lutheran Sanit. TB	Church		110	82	..	..	50
Woodmen, 400—El Paso Modern Woodmen of America SanatoriumA	TB	Frat	155	80	..	..	113
Wray, 1,785—Yuma Wray Hospital	Gen	Indiv	16	7	8	75	300

Related Institutions

Boulder, 11,223—Boulder Boulder County Hospital... Gen	County		40	30	5	84	534
Mesa Vista Sanatorium.....	TB	Part	30	30	..	..	28
Burlington, 1,280—Kit Carson Burlington Hospital	Gen	Part	8	3	3	49	191
Canon City, 5,938—Fremont Colorado State Penitentiary Hospital	Inst	State	45	36	..	..	1,770
Collbran, 341—Mesa Plateau Valley Congregation Hospital	Gen	Church	15	5	4	31	223
Colorado Springs, 33,237—El Paso Cragmor Sanatorium	TB	NPAssn	150	..	No data supplied	..	..
Denver, 287,861—Denver Costello Home	TB	Frat	16	10	..	..	5
Florence Crittenton Home (Mary H. Donaldson Woman's Hospital)	Mat	NPAssn	11	3	9	104	115
Oakes Home Sanitarium.....	TB	Church	100	52	..	..	82
St. Francis Sanatorium.....	TB	Church	16	14	..	..	26
Salvation Army Woman's Home and Hospital.....	Mat	Church	36	20	20	85	127
Englewood, 7,980—Arapahoe Temple Sanatorium	Conv	Indiv	30	20	..	..	57

COLORADO—Continued

REGISTERED HOSPITALS

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Flagler, 540—Kit Carson Hospital	Gen	Indiv	9	5	4	26	229
Fruita, 1,033—Mesa Fruit Community Hosp...	Gen	Indiv	8	3	2	21	159
Golden, 2,426—Jefferson Hospital—State Industrial School for Boys	Inst	State	25	7	..	..	768
Grand Junction, 10,247—Mesa State Home and Training School for Mental Defectives	McDe	State	450	380	..	..	33
Greeley, 12,203—Weld Island Grove Hospital	Inst	State	66	50	..	..	235
Homelake, 225—Rio Grande Colorado State Soldiers and Sailors Home	Inst	State	35	19	..	..	78
Longmont, 6,029—Boulder Loveland Hosp. and Clinic	Gen	Indiv	23	11	5	40	405
Loveland, 5,506—Larimer Monte Vista, 2,610—Rio Grande	Gen	Part	10	6	4	27	207
Ridge, 207—Jefferson State Home and Training School for Mental Defectives	Gen	Indiv	9	5	5	38	212
Yuma, 1,360—Yuma Yuma Community Hospital	McDe	State	325	267	..	..	40

CONNECTICUT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Bridgeport, 146,716—Fairfield Bridgeport Hospital	Gen	NPAasn	326	276	74	1,511	10,382
Englewood Hospital	Gen	City	150	35	..	..	385
St. Vincent's Hospital	TbIso	Church	270	180	55	1,196	7,343
Bristol, 28,451—Hartford Bristol Hospital	Gen	NPAasn	100	74	25	473	2,939
Canaan, 665—Litchfield Robert C. Geer Memorial Hospital	Gen	NPAasn	25	10	7	50	370
Cromwell, 2,814—Middlesex Cromwell Hall	Gen	NPAasn	33	18	..	..	85
Danbury, 22,261—Fairfield Danbury Hospital	Nerv	Corp	157	85	23	515	3,324
Derby, 10,788—New Haven Griffin Hospital	Gen	NPAasn	82	65	19	457	2,142
Greens Farms, 275—Fairfield Hall-Drooke Sanitarium	Gen	NPAasn	70	46	..	..	115
Greenwich, 5,951—Fairfield Blythebrook Hospital	N&M	Corp	79	51	..	..	130
Greenwich Hospital	N&M	Corp	118	84	20	430	3,019
St. Luke's Convalescent Hospital	Gen	NPAasn	134	85	..	..	881
Hartford, 164,072—Hartford Avery Convalescent Hospital Unit of Hartford Hospital	Conv	Church	223	219	..	..	186
Cedarcrest Sanatorium	Tb	State	671	527	93	2,112	10,015
Hartford Hospital	Gen	NPAasn	54	47	6	158	1,017
Mt. Sinai Hospital	Gen	NPAasn	315	209	39	331	4,772
Municipal Hospital	Gen	City	270	550	293	..	693
Neuro-Psychiatric Institute of the Hartford Retreat	N&M	NPAasn	35	15	..	..	675
St. Francis Hospital	Gen	NPAasn	116	79	24	328	2,008
Lakeville, 1,800—Litchfield Hotchkiss School Infirmary	Gen	Church	326	176	..	..	2,498
Manchester, 21,972—Hartford Manchester Memorial Hosp.	Gen	NPAasn	3,315	3,292	..	..	114
Meriden, 38,451—New Haven Meriden Hospital	Gen	NPAasn	167	82	27	..	1,084
Meriden Hospital	Gen	NPAasn	50	21	15	132	3,287
Undercliff, Meriden Tuberculosis Sanatorium	State	NPAasn	217	148	40	867	4,941
Middletown, 24,554—Middlesex Connecticut State Hosp.	Ment	State	8	2	..	..	77
Milford, 12,020—New Haven Milford Hospital	Gen	NPAasn	227	180	44	1,009	6,218
New Britain, 68,128—Hartford New Britain Gen. Hosp.	Gen	NPAasn	225	219	45	928	6,704
New Haven, 162,655—New Haven Dr. J. H. Evans' Private Hospital	Gen	NPAasn	331	291	50	876	9,765
Grace Hospital	Gen	Indiv	200	173	..	..	59
Hospital of St. Raphael	Gen	NPAasn	35	206	..	..	1,943
New Haven Hospital	Gen	NPAasn	60	25	12	98	720
Newington, 4,572—Hartford Newington Home for Crippled Children	Orth	NPAasn	260	131	28	710	3,322
Veterans Admin. Facility	Vet	NPAasn	200	173	..	..	59
New London, 29,640—New London Home Memorial Hospital	Gen	NPAasn	60	25	12	98	720
Lawrence and Memorial Associated Hospitals	Gen	NPAasn	260	131	28	710	3,322

Key to symbols and abbreviations is on page 1195

CONNECTICUT—Continued

John A. N. 1
March 1911

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Dr. Lena's Surgical Hosp...	Surg	Indiv	26	15	..	..	..
U. S. Coast Guard Academy Hospital	USPHS	..	30	3	..	..	..
New Milford, 3,000—Litchfield New Milford Hospital	Gen	NPAasn	30	9	7	8	..
Newtown, 482—Fairfield Fairfield State Hospital	Ment	State	106	131	20	88	70
Norwalk, 36,019—Fairfield Norwalk General Hospital	Gen	NPAasn	3,037	2,045	..	..	..
Norwich, 23,021—New London Norwich State Hospital	Ment	State	356	335	..	..	24
Norwich State Hospital	Ment	State	356	335	..	..	24
Sanat. (Uncas-On-Thames) TB William W. Backus Hos. pital	TB	State	356	335	..	..	24
Portland, 2,500—Middlesex Elmcrest Manor	Gen	NPAasn	127	88	25	36	47
Putnam, 7,318—Windham Day Kimball Hospital	N&M	Indiv	25	21	..	..	1
Rockville, 7,445—Tolland Rockville City Hospital	Gen	NPAasn	70	51	16	23	17
Sharon, 500—Litchfield Sharon Hospital	Gen	NPAasn	35	22	9	131	8
Shelton, 10,113—Fairfield cularis State Sanatorium	TB	State	380	344	..	..	20
South Norwalk, —Fairfield Dr. Wadsworth's Sanitarium	N&M	Indiv	35	..	..	..	..
Stafford Springs, 3,492—Tolland Cyril and Julia C. Johnson Memorial Hospital	Gen	NPAasn	38	31	12	20	..
Stamford, 46,346—Fairfield Dr. Barnes Sanitarium	Gen	NPAasn	60	36	..	..	1
Stamford Hall	N&M	Corp	160	120	..	..	1
Tophamsee Hospital	N&M	Corp	221	136	39	870	54
Thompsonville, 9,643—Hartford Elmcrest-Dr. Vall's Sanat.	N&M	Corp	26	10	..	..	1
Torrington, 26,040—Litchfield Charlotte Hungerford Hos. pital	Gen	NPAasn	20	..	..	..	..
Wallingford, 11,170—New Haven Gaylord Farm Sanatorium	TB	NPAasn	130	75	29	521	263
Waterbury, 99,002—New Haven St. Mary's Hospital	Gen	NPAasn	145	138	..	..	27
Waterbury Hospital	Gen	Church	220	204	44	886	6,820
Waterford, 100—New London The Seaside	Gen	NPAasn	289	201	47	617	6,771
West Haven, 25,808—New Haven William Wirt Winchester Hospital	TbChil	State	145	136	..	..	21
Westport, 6,073—Fairfield Westport Sanitarium	TB	NPAasn	62	51	..	..	2
Williamantic, 12,102—Windham Windham Community Me. morial Hospital	N&M	Corp	100	78	..	..	2
Winthrop, 7,883—Litchfield Litchfield County Hospital	Gen	NPAasn	91	62	15	241	1,518
Arden, 1,738—Hartford Arden Old Farms Infirmary	Inst	NPAasn	12	8	..	..	27
Bridgeport, 146,716—Fairfield Hillside Home and Hospital	Chr	City	272	252	..	..	60
Cheshire, 3,263—New Haven Connecticut Reformatory	Inst	State	28	5	..	..	10
Greenwich, 5,951—Fairfield Crest View Sanitarium	N&M	Corp	22	16	..	..	4
Mansfield Depot, 300—Tolland Municipal Hospital	TbIso	City	71	46	2	1	22
Mansfield State Training School and Hospital	McDe	State	1,200	1,190	..	..	6
Meriden, 38,451—New Haven Silver Hill	Nerv	Corp	18	8	..	..	60
New Haven, 162,655—New Haven Jewish Home for the Aged	Inst	NPAasn	22	15	..	..	13
Yale Infirmary	Inst	NPAasn	93	90	..	..	25
Connecticut State Farm for Women	Inst	NPAasn	30	12	..	..	71
Noroton Heights, 1,600—Fairfield Fitch's Home and Hospital	Inst	State	60	40	8	50	1
Nestledown Convalescent Hos. pital	Inst	State	114	101	..	..	1,771
Springdale, 4,500—Fairfield Nestledown Home	ConvN&M	Indiv	38	..	..	..	25
Stamford, 46,346—Fairfield Pinewood Rest	Conv	Indiv	18	10	..	..	17
Waterbury, 99,002—New Haven West Hartford Children's Hosp.	McDe	Indiv	129	65	..	..	8
West Hartford, 24,941—Hartford St. Agnes Home	Mat	Church	9	3	6	72	72
West Suffield, 700—Hartford Travellers Rest Home	Conv	NPAasn	20	20	..	..	4

CONNECTICUT—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Wethersfield, 7,512—Hartford Connecticut State Prison Hospital	Inst	State	30	14	..	...	235
Woodmont, 531—New Haven Woodmont Hall	Conv	Indiv	12	7	..	...	34

DELAWARE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Dover, 4,800—Kent Kent General Hospital*.....	Gen	NPAssn	50	30	10	163	1,114
Farmhurst, 250—New Castle Delaware State Hospital*+.....	Ment	State	1,239 ¹	1,175	..	...	295
Fort Dupont (Delaware City P.O.), —New Castle Station Hospital	Gen	Army	28	14	..	...	360
Lewes, 1,923—Sussex Beebe Hospital*.....	Gen	NPAssn	99	34	8	105	1,097
Marshallton, 1,500—New Castle Brandywine Sanatorium.....	TB	State	160	138	..	...	113
Edgewood Sanatorium	TB	State	40	33	..	...	21
Milford, 3,719—Sussex Milford Memorial Hospital*.....	Gen	NPAssn	100	50	22	181	2,115
Wilmington, 106,597—New Castle Delaware Hospital*+.....	Gen	NPAssn	201	131	24	482	4,673
Gross Private Hospital.....	Gen	Corp	15	7	6	00	238
Homeopathic Hospital*+.....	Gen	NPAssn	204	127	35	587	4,475
St. Francis Hospital*+.....	Gen	Church	104	52	31	315	2,049
Wilmington General Hospital*+.....	Gen	NPAssn	140	88	48	858	4,244
Related Institutions							
Marshallton, 1,500—New Castle Sunnybrook Cottage	TbChil	NPAssn	24	18	..	...	20
Smryna, 1,958—Kent Delaware State Welfare Home	Inst	Gen State Co	86	68	4	23	602
Stockley, 128—Sussex Delaware Colony	McDe	State	502 ¹	423	1	3	71

DISTRICT OF COLUMBIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Washington, 623,000 Central Dispensary and Emergency Hospital*+.....	Gen	NPAssn	280	245	..	...	7,255
Children's Hospital*+.....	Chil	NPAssn	200	122	..	...	6,904
Columbia Hospital for Women and Lying-In Asylum*+.....	GynMat	NPAssn	127	81	83	2,189	3,752
Eastern Dispensary and Casualty Hospital.....	Gen	NPAssn	150	72	12	17	2,715
Episcopal Eye, Ear and Throat Hospital*+.....	EXT	Church	100	63	..	...	6,244
Freedmen's Hospital*+.....	Gen	Fed	322	256	54	1,050	6,501
Gallinger Municipal Hospital*+.....	Gen	City	1,105	845	115	1,839	15,889
Garfield Memorial Hosp.*+.....	Gen	NPAssn	334	295	98	1,883	10,020
Georgetown University Hospital*+.....	Gen	NPAssn	210	185	51	1,108	6,080
George Washington University Hospital*+.....	Gen	NPAssn	92	73	22	587	2,695
Glenn Dale Sanatorium.....	See	Tuberculosis Sanatorium					
National Homeopathic Hospital*+.....	Gen	NPAssn	60	45	18	305	1,536
Providence Hospital*+.....	Gen	Church	260	205	30	1,141	7,029
St. Elizabeth's Hospital*+.....	Gen	Fed	450	420	4	5	1,796
Sibley Memorial Hospital*+.....	Gen	Fed	6,450	6,251	..	...	1,126
Tuberculosis Sanatorium*+.....	Gen	Church	359	288	104	2,145	8,310
(Glenn Dale, Md. P.O.).....	TB	City	670	608	..	...	538
U. S. Naval Hospital*+.....	Gen	Navy	178	177	..	...	1,814
Veterans Admin. Facility*+.....	Gen	Vet	327	318	..	...	4,998
Walter Reed General Hospital*+.....	Gen	Army	1,281	978	15	191	7,737
Washington Sanitarium and Hospital*+.....	Gen	Church	170	135	18	423	3,206
Related Institutions							
Washington, 623,000 District of Columbia Reformatory Hospital (Lorton, Va. P.O.).....	Inst	City	80	22	..	...	1,056
District Training School (Laurel, Md. P.O.).....	McDe	City	600	572	..	...	37
Florence Crittenton Home.....	Mat	NPAssn	50	48	12	88	105
Home for the Aged and Infirm	Inst	City	120	124	..	...	494
Kendall House Sanitarium.....	Conv	Indiv	22	10	..	...	75
National Training School for Boys Hospital	Inst	Fed	50	13	..	...	1,146
U. S. Soldiers' Home Hospital*+.....	Inst	Gen Fed	500	273	..	...	1,643
Washington Home for Incurables	Incur	NPAssn	100	155	..	...	50

FLORIDA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Arcadia, 4,082—De Soto Arcadia General Hospital... Gen	Corp		25	7	3	122	692
Bartow, 5,269—Polk Bartow General Hospital.... Gen	Indiv		21	6	4	45	510
Polk County Hospital..... Gen	County		59	56	5	55	1,665
Bay Pines, —Pinellas Veterans Admin. Facility*+.....	Gen	Vet	444	239	..	...	2,463
Bradenton, 5,986—Manatee Bradenton General Hospital Gen	Part		15	7	7	43	290
Century, 1,250—Escambia Turberville Hospital*+.....	Gen	NPAssn	40	15	4	23	624
Obattahoochee, 450—Gadsden Florida State Hospital*+.....	Ment	State	4,728 ¹	4,362	..	...	1,034
Clearwater, 7,007—Pinellas Morton F. Plant Hospital*+.....	Gen	NPAssn	50	20	10	97	790
Coral Gables, 5,097—Dade University Hospital	Gen	Corp	35	20	16	166	1,023
Dade City, 1,811—Pasco Jackson Memorial Hospital. Gen	County		20	6	3	26	258
Daytona Beach, 16,598—Volusia Halifax District Hospital*+.....	Gen	NPAssn	145	48	35	179	1,591
De Land, 5,246—Volusia De Land Memorial Hospital Gen	NPAssn		23	6	8	34	458
Dunedin, 1,435—Pinellas Mease Hospital	Gen	NPAssn	24	6	4	51	312
Eustis, 2,835—Lake Lake County Medical Center Gen	NPAssn		50	28	7	133	1,033
Fort Barrancas, 150—Escambia Station Hospital	Gen	Army	55	40	..	...	920
Fort Lauderdale, 8,606—Broward Broward General Hospital.. Gen	CyCo		48	22	5	161	1,481
Fort Myers, 9,082—Lee Lee Memorial Hospital..... Gen	NPAssn		30	14	4	134	857
Fort Pierce, 4,803—St. Lucie Fort Pierce Memorial Hospital	Gen	NPAssn	32	...	6	Estab. 1939	
Gainesville, 10,465—Alachua Alachua County Hospital*+.....	Gen	County	63	31	10	173	1,301
Hollywood, 2,800—Broward Hollywood Hospital	Gen	Indiv	20	9	6	71	361
Jacksonville, 129,549—Duval Brewster Hospital*+.....	Gen	Church	65	28	10	202	837
Duval County Hospital*+.....	Gen	County	225	223	15	726	4,915
Hazlehurst Sanatorium.....	TB	NPAssn	21	15	..	...	17
Negro Tuberculosis Hospital TB Dr. Randolph's Sanitarium.. N&M	Indiv		10	4	..	...	32
Riverside Hospital*+.....	Gen	NPAssn	50	26	6	61	1,223
St. Luke's Hospital*+.....	Gen	NPAssn	176	108	24	777	5,312
St. Vincent's Hospital*+.....	Gen	Church	200	138	40	747	5,939
Key West, 12,831—Monroe U. S. Marine Hospital*+.....	Gen	USPHS	65	49	..	5	781
Kissimmee, 3,163—Osceola Osceola Hospital	Gen	Indiv	49	15	5	50	701
Lake City, 4,416—Columbia Lake Shore Hospital.....	Gen	Corp	15	13	2	31	560
Veterans Admin. Facility*+.....	Gen	Vet	333	297	..	...	2,470
Lakeland, 18,554—Polk Morrell Memorial Hospital.. Gen	City		100	47	8	240	1,866
Lake Wales, 3,401—Polk Lake Wales Hospital.....	Gen	NPAssn	25	6	6	36	227
Leesburg, 4,113—Lake Theresa Holland Hospital.. Gen	Indiv		23	10	4	74	689
Manatee, 3,219—Manatee Riverside Hospital	Gen	Indiv	30	10	3	35	438
Marianna, 3,372—Jackson Baltzell Hospital	Gen	Indiv	19	6	1	2	230
Melbourne, 2,677—Brevard Brevard Hospital	Gen	City	25	8	6	42	349
Miami, 110,627—Dade Dade County Hospital*+.....	GenTb	County	181	119	20	381	2,427
James M. Jackson Memorial Hospital*+.....	Gen	City	460	344	40	1,341	14,048
Miami Retreat	N&M	Indiv	80	47	..	...	401
Miami Riverside Hospital.....	Gen	Indiv	50	15	10	107	612
Sun-Ray Park Health Resort	N&M	Indiv	65	13	..	...	211
Victoria Hospital	Gen	Indiv	75	31	16	316	1,873
Miami Beach, 6,494—Dade Miami Beach Hospital.....	Gen	Corp	50	...	6	Reopened	
St. Francis Hospital*+.....	Gen	Church	175	63	15	170	2,426
Miami Springs, 402—Dade Miami-Battle Creek Sanit... Gen	NPAssn		105	27	..	...	417
Ocala, 7,281—Marion Munroe Memorial Hospital*+.....	Gen	CyCo	85	32	11	110	1,122
Orlando, 27,330—Orange Florida Sanitarium and Hospital*+.....	Gen	Church	100	61	12	151	1,827
Florida State Sanatorium.. TB	State		318	314	..	...	243
Orange General Hospital*+.....	Gen	NPAssn	135	70	12	278	2,829
Panama City, 5,402—Bay Lisenby Hospital	Gen	Indiv	26	6	3	63	335
Panama City Hospital.....	Gen	NPAssn	15	4	5	77	341
Pensacola, 31,579—Escambia Escambia County Tuberculosis Sanatorium	TB	CyCo	56	25	..	...	92
Pensacola Hospital*+.....	Gen	Church	127	79	21	516	2,586
U. S. Naval Hospital*+.....	Gen	Navy	142	78	..	...	990
Quincy, 3,788—Gadsden Gadsden County Hospital.. Gen	NPAssn		35	12	2	49	576

FLORIDA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
St. Augustine, 12,111—St. Johns East Coast Hospital▲.....	Gen	NPAasn	55	41	5	104	1,343
Flagler Hospital▲.....	Gen	NPAasn	66	25	7	107	883
St. Petersburg, 40,423—Pinellas Mercy Hospital.....	Gen	City	46	18	4	21	497
Mound Park Hospital▲.....	Gen	City	164	93	16	359	5,461
St. Anthony's Hospital▲.....	Gen	Church	73	33	15	125	1,415
Sanford, 10,100—Seminole Fernald-Laughton Memorial Hospital.....	Gen	NPAasn	21	9	6	83	541
Sarasota, 8,398—Sarasota Joseph Halton Hospital....	Gen	Indiv	14	12	5	12	500
Sarasota Hospital.....	Gen	City	52	15	8	108	849
Sebring, 2,912—Highlands Sebring General Hospital....	Gen	Indiv	25	7	7	21	298
Dr. Weems' Hospital.....	Gen	Indiv	16	6	3	88	517
Stuart, 1,924—Martin Martin County Hospital....	Gen	NPAasn	25	...	8	Estab.	1939
Tallahassee, 10,700—Leon Johnston's Sanitarium.....	Gen	Indiv	31	11	8	130	653
Tampa, 101,161—Hillsborough Centro Asturiano Hospital. Gen	Frat		75	56	4	130	876
Clara Frye Tampa Municipal Negro Hospital.....	Gen	City	60	36	9	129	1,696
Dr. H. M. Cook's Hospital....	Gen	Indiv	28	13	6	115	896
Hillsborough County Home and Hospital.....	InstGen	County	230	211	6	157	1,545
Pine Heath Hospital.....	TbChil	City	40	...	...	Estab.	1939
St. Joseph's Hospital▲.....	Gen	Church	63	29	25	184	1,256
Tampa Municipal Hosp.▲.....	Gen	City	286	153	25	707	6,299
Umatilla, 997—Lake Harry-Anna Crippled Children's Home.....	Orth	Frat	75	39	...	...	140
West Palm Beach, 26,610—Palm Beach Good Samaritan Hosp.▲.....	Gen	NPAasn	110	68	18	368	2,568
Pine Ridge Hospital.....	Gen	NPAasn	27	22	4	10	608

Related Institutions

Daytona Beach, 16,598—Volusia Daytona Beach Sanitarium. Gen	Indiv		10	4	2	12	115
Fort Lauderdale, 8,666—Broward Provident Hospital.....	Gen	NPAasn	15	9	4	33	368
Gainesville, 10,465—Alachua Florida Farm Colony.....	McDe	State	550†	555	...	...	35
University of Florida Infirmary▲.....	Inst	State	45	7	...	...	671
Jacksonville, 129,549—Duval Dr. Miller's Sanitarium.....	Drug	Indiv	20	4	...	...	145
Largo, 4,429—Pinellas Pinellas County Home.....	GenTb	County	110	70	...	...	130
Leesburg, 4,113—Lake Community Hospital.....	Gen	Indiv	10	2	2	24	175
Miami, 110,637—Dade Christian Hospital.....	Gen	NPAasn	25	8	4	115	348
Edgewater Hospital.....	Gen	Part	28	15	8	99	396
Orange Park, 661—Clay Moosehaven Hospital.....	Inst	Frat	25	16	...	...	64
Palatka, 6,500—Putnam Glendale Hospital.....	Gen	Indiv	25	9	4	50	562
Mary Lawson Sanatorium..	Gen	Indiv	50	5	6	9	183
Raiford, 460—Union Florida State Farm Hosp....	Inst	State	80	40	...	...	1,165
St. Petersburg, 40,423—Pinellas American Legion Hospital for Crippled Children.....	Orth	NPAasn	40	17	...	...	134
Earle Restorium.....	Conv	Indiv	30	11	...	...	130
Florence Crittenton Home..	Mat	NPAasn	16	11	14	27	32
Tallahassee, 10,700—Leon Florida Agricultural and Mechanical College Hospital°	InstGen	State	43	21	2	7	647
Tampa, 101,161—Hillsborough Hillsboro County Tuberculosis Sanatorium.....	TB	County	80	70	...	...	76
Vero Beach, 2,268—Indian River Indian River Hospital.....	Gen	Indiv	21	8	5	33	377
West Palm Beach, 26,610—Palm Beach Palm Beach County Tuberculosis Sanatorium for Negroes.....	TB	NPAasn	10	11	...	...	33

GEORGIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Albany, 14,507—Dougherty Phoebe Putney Memorial Hospital▲.....	Gen	NPAasn	51	32	14	194	2,681
Alto, 219—Hawthornham State Tuberculosis Sanatorium▲.....	TB	State	315	275	...	...	675
Americus, 5,700—Sumter Americus and Sumter County Hospital.....	Gen	NPAasn	25	13	5	55	359

GEORGIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Athens, 18,192—Clarke Athens General Hospital▲....	Gen	County	78	31	10	51	1,187
St. Mary's Hospital.....	Gen	Church	50	27	10	115	87
Atlanta, 360,601—Fulton Albert Steiner Clinic for Cancer and Allied Diseases▲.....	Cancer	City	38	31	...	...	77
Battle Hill Sanatorium.....	TB	CyCo	236	231	...	...	19
Blackman Sanatorium.....	Gen	Indiv	25	14	...	...	59
Crawford W. Long Memorial Hospital▲.....	Gen	NPAasn	180	117	20	95	3,192
Georgia Baptist Hospital▲.....	Gen	Church	154	130	30	64	1,244
Grady Hospital▲.....	Gen	City	565	483	81	3,943	2,254
Grady Hospital, Emory University Division.....	Unit of	Grady Hospital					
Henrietta Eggleston Hospital for Children▲.....	Chil	NPAasn	44	29	...	...	103
Piedmont Hospital▲.....	Gen	Corp	142	100	20	352	1,045
Ponce de Leon Eye, Ear and Throat Infirmary.....	ENT	Indiv	12	6	...	...	61
St. Joseph Infirmary▲.....	Gen	Church	135	115	21	619	1,688
Veterans Admin. Facility▲.....	Gen	Vet	265	238	...	...	500
Augusta, 60,342—Richmond University Hospital▲.....	Gen	City	300	269	45	77	507
Veterans Admin. Facility▲.....	Ment	Vet	1,120	1,006	...	...	75
Wilkesford Hospital for Women and Children▲.....	Gen	NPAasn	46	18	4	53	193
Bainbridge, 6,141—Decatur Bainbridge Hospital.....	Surg	Indiv	32	17	1	23	46
Riverside Hospital.....	Gen	Part	24	...	...	...	Nodes supplied
Brunswick, 14,022—Glynn Brunswick City Hospital....	Gen	CyCo	50	25	6	118	1,077
Cairo, 3,169—Grady Cairo Hospital.....	Gen	Indiv	18	5	4	67	67
Canton, 2,892—Cherokee Cokers' Hospital.....	Gen	Corp	30	19	3	31	63
Cedartown, 8,124—Polk Hall-Chaudron Hospital....	Gen	Indiv	8	7	2	20	19
Columbus 43,131—Muscookee Columbus City Hospital▲.....	Gen	City	175	165	25	47	1,594
Cuthbert, 3,235—Randolph Patterson Hospital▲.....	Gen	Indiv	30	14	3	38	67
Dalton, 8,160—Whitfield Hamilton Memorial Hosp... Gen	NPAasn		35	15	5	170	75
Decatur, 13,276—De Kalb Scottish Rite Hospital for Crippled Children▲.....	Orth	Frat	60	60	...	...	24
Donaldsonville, 1,183—Seminole Chason's Hospital.....	Gen	Part	20	12	6	120	20
Douglas, 4,206—Coffee Douglas Hospital.....	Gen	City	32	12	3	54	55
Dublin, 6,681—Laurens Claxton Sanitarium.....	Gen	Indiv	55	27	5	74	1,200
Hicks Hospital.....	Gen	Indiv	20	6	1	10	34
Eastman, 3,022—Dodge Clinic Hospital.....	Gen	Indiv	12	3	2	14	31
Coleman Sanatorium▲.....	Gen	Indiv	39	10	4	11	32
Elberton, 4,650—Elbert Elbert County Hospital....	Gen	CyCo	12	3	3	30	32
Thompson-Johnson Hospital	Gen	Part	10	5	1	79	45
Emory University, —De Kalb Emory University Hosp.▲.....	Gen	NPAasn	226	150	23	694	6,711
Fort Benning, —Chattahoochee Station Hospital▲.....	Gen	Army	364	192	8	113	1,555
Fort McPherson (Atlanta P.O.)—Fulton Station Hospital▲.....	Gen	Army	247	145	4	55	1,530
Fort Oglethorpe, 1,156—Catoosa Station Hospital▲.....	Gen	Army	262	131	6	17	280
Fort Screven, —Chatham Station Hospital.....	Gen	Army	50	36	1	12	32
Gainesville, 3,624—Hall Downey Hospital▲.....	Gen	Corp	52	26	6	105	1,200
Hall County Memorial Hosp. Gen	County		30	14	4	25	20
Griffin, 10,321—Spalding R. F. Strickland and Son Memorial Hospital.....	Gen	Indiv	45	22	5	50	1,154
Hawkinsville, 2,484—Pulaski R. J. Taylor Memorial Hosp. Gen	NPAasn		45	10	5	32	63
Homer, 1,150—Clinch Huey Hospital.....	Gen	Indiv	10	7	1	12	75
Hoschton, 427—Jackson Allen Clinic and Hospital..	Gen	Part	14	7	2	23	33
Jesup, 2,303—Wayne Drs. Colvin-Ritch Hospital..	Gen	Part	27	13	5	116	77
La Grange, 20,121—Troup City-County Hospital.....	Gen	CyCo	60	50	6	136	1,164
Macon, 61,045—Bibb Clinic Hospital.....	Gen	Corp	26	12	4	61	24
Macon Hospital▲.....	Gen	CyCo	182	161	25	62	1,207
Middle Georgia Hospital▲.....	Gen	Corp	50	25	11	179	1,644
Oglethorpe Private Infirmary▲.....	Gen	Corp	25	17	6	75	24
St. Luke Hospital.....	Gen	Indiv	15	4	1	19	24
Marietta, 7,525—Cobb Marietta Hospital.....	Gen	Corp	20	5	2	67	20
Metter, 1,424—Candler Kennedy Memorial Hospital. Gen	Part		25	15	3	33	63
Milledgeville, 5,254—Baldwin Allen's Invalid Home.....	N&M	Indiv	120	107	...	...	57

Key to symbols and abbreviations is on page 1155

GEORGIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admis- sions †
Baldwin Memorial Hospital▲ Gen	Indiv		70	29	15	67	1,169
Milledgeville State Hosp.◦... Ment	State		7,076†	7,188	...	...	1,176
Scott Hospital..... Gen	Indiv		25	18	4	12	335
Millen, 2,527—Jenkins							
Millen Hospital▲..... Gen	Indiv		28	9	5	20	479
Mulkey Hospital..... Gen	Indiv		25	8	6	40	414
Monroe, 3,706—Walton							
Walton County Hospital... Gen	CyCo		17	3	4	16	249
Montezuma, 2,234—Macon							
Nacon County Clinic..... Gen	Part		20	6	3	25	210
Moultrie, 8,027—Cloquitt							
Vereen Memorial Hospital.. Gen	NPAasn		43	...	6	Estab.	1939
Nashville, 1,672—Berrien							
Turner Hospital..... Gen	Indiv		10	3	2	69	278
Ocilla, 2,034—Irwin							
Ocilla Hospital..... Gen	Part		20	8	4	43	474
Quitman, 1,149—Brooks							
Brooks County Hospital.... Gen	CyCo		32	8	4	52	623
Rome, 21,543—Floyd							
Harbin Hospital▲..... Gen	Part		60	31	6	157	2,746
McCall Hospital▲..... Gen	Part		75	29	10	230	2,682
Royston, 1,447—Franklin							
Brown's Hospital..... Gen	Indiv		15	12	2	22	360
Sandersville, 3,011—Washington							
Rawling's Sanitarium..... Gen	Corp		50	28	6	77	1,125
Savannah, 85,024—Chatham							
Central of Georgia Rail- way Hospital▲..... Indus	NPAasn		62	43	..	...	1,902
Charity Hospital..... Gen	NPAasn		43	42	12	268	2,692
Georgia Infirmary..... Gen	NPAasn		60	60	6	257	2,255
Oglethorpe Sanatorium..... Gen	Indiv		50	35	6	74	...
St. Joseph Hospital▲◦..... Gen	Church		100	43	12	247	1,760
Telfair Hospital..... Gen	NPAasn		65	60	20	552	2,698
U. S. Marine Hospital▲..... Gen	USPHS		178	163	...	...	1,524
Warren A. Candler Hosp.▲◦ Gen	Church		86	60	11	232	1,739
Smyrna, 1,178—Cobb							
Dr. Brawner's Sanitarium... N&M	Indiv		40	33	..	...	316
Statesboro, 3,996—Bulloch							
Bulloch County Hospital.... Gen	County		50	10	6	41	599
Van Buren's Sanitarium.... Gen	Indiv		25	3	..	12	55
Swainsboro, 2,442—Emanuel							
Franklin Hospital..... Gen	Indiv		20	6	2	12	312
Tate, 1,548—Pickens							
Robinson Hospital..... Gen	Indiv		12	6	2	24	335
Thomasville, 11,733—Thomas							
John D. Archbold Memorial Hospital▲..... Gen	NPAasn		100	52	12	148	2,329
Tifton, 3,390—Tift							
Coastal Plain Hospital.... Gen	Corp		25	6	2	21	303
Toccoa, 4,602—Stephens							
Stephens County Hospital.. Gen	CyCo		30	10	3	135	854
Trion, 3,289—Chattooga							
Riegel Hospital..... Gen	Indiv		35	18	5	175	1,213
Valdosta, 13,482—Lowndes							
Frank Bird Hospital..... Gen	Indiv		22	...	No data supplied		
Little-Griffin-Owens-Saunders Private Hospital..... Gen	Corp		57	21	6	217	1,397
Vidalia, 3,585—Toombs							
Bethany Home Hospital.... Gen	Church		30	...	No data supplied		
Warm Springs, 400—Meriwether							
Georgia Warm Springs Foundation▲..... Orth	NPAasn		113	71	..	...	230
Washington, 3,158—Wilkes							
Washington General Hosp... Gen	City		28	13	4	80	896
Waycross, 15,510—Ware							
Atlantic Coast Line Hosp.▲. Indus	NPAasn		75	31	...	...	1,018
Ware County Hospital▲..... Gen	County		67	49	8	210	2,441
West Point, 2,146—Troup							
Valley Hospital..... Gen	NPAasn		25	9	4	84	542
Related Institutions							
Atlanta, 360,691—Fulton							
Dwelle's Infirmary..... Gen	Indiv		15	5	2	11	140
Florence Crittenton Home.. Mat	NPAasn		26	25	12	35	71
Georgia Sanitarium..... Gen	Indiv		8	1	2	5	70
Joseph B. Whitehead Me- morial Hospital..... Inst	State		24	1	..	...	355
U. S. Penitentiary Hosp.▲... Inst	Fed		148	112	...	...	1,612
Venerable Hosp. and Clinic... Ven	City		75	50	...	...	406
William A. Harris Memorial Hospital..... Gen	Indiv		25	15	1	8	588
Barwick, 499—Brooks							
Sanchez Private Sanitarium. Gen	Indiv		15	5	2	48	418
Cedartown, 8,124—Polk							
Cedartown Hospital..... Gen	Indiv		12	6	4	36	210
Whitely Hospital..... Gen	Indiv		10	2	3	10	150
Columbus, 43,131—Muscookee							
Muscookee County Tubercu- losis Sanatorium..... TB	County		48	23	..	...	57
Cordele, 6,880—Crisp							
Gillespie Hospital..... Gen	Church		25	4	4	12	110
Gracewood, 500—Richmond							
Georgia Training School for Mental Defectives..... McDe	State		334†	328	..	...	27
Moultrie, 8,027—Colquitt							
Daniel Emergency Sanit.... Gen	Indiv		16	2	3	48	426
Summerville, 933—Chattooga							
Summerville-Trion Hospital. Gen	Corp		15	7	3	45	423

IDAHO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admis- sions †
American Falls, 1,280—Power							
Schlitz Memorial Hospital.. Gen	County		22	13	8	99	698
Boise, 21,544—Ada							
St. Alphonsus Hospital▲◦... Gen	Church		135	102	20	321	2,754
St. Luke's Hospital▲◦..... Gen	Church		115	94	18	562	4,485
Veterans Admin. Facility▲... Gen	Vet		104	142	..	...	1,211
Bonnors Ferry, 1,418—Boundary							
Bonnors Ferry Hospital..... Gen	Corp		25	9	8	86	290
Burley, 3,826—Cassia							
Cottage Hospital..... Gen	Corp		15	14	4	61	589
Caldwell, 4,974—Canyon							
Caldwell Sanitarium..... Gen	Part		17	8	6	108	461
Coeur d'Alene, 8,297—Kootenai							
Coeur d'Alene Hospital..... Gen	NPAasn		30	14	3	2	73
Lakeside Hospital..... Gen	Indiv		16	7	4	20	250
Cottonwood, 519—Idaho							
Our Lady of Consolation Hospital..... Gen	Church		30	13	4	30	480
Fort Hall, 100—Bingham							
Fort Hall Indian Agency Hospital..... Gen	IA		16	11	4	52	287
Gooding, 1,592—Gooding							
Gooding County Hospital... Gen	CyCo		18	6	8	182	610
Hailey, 973—Blaine							
Hailey Clinical Hospital.... Gen	Indiv		24	11	6	45	530
Idaho Falls, 9,429—Bonneville							
Idaho Falls Latter-Day Saints' Hospital▲◦..... Gen	Church		91	65	31	667	3,457
Spencer Hospital..... Gen	Indiv		26	12	6	54	700
Kellogg, 4,124—Shoshone							
Wardner Hospital..... Gen	Part		35	18	6	107	1,169
Lapwai, 416—Nez Perce							
Fort Lapwai Sanatorium▲.. TB	IA		132	117	..	2	202
Lewiston, 9,403—Nez Perce							
St. Joseph's Hospital▲◦..... Gen	Church		90	66	18	297	1,787
White Hospital..... Gen	NPAasn		32	13	6	40	378
Malad City, 2,535—Oneida							
Oneida Hospital..... Gen	County		20	7	8	123	456
Moscow, 4,476—Latah							
Gritman Private Hospital... Gen	Indiv		38	16	9	124	712
Nampa, 8,206—Canyon							
Mercy Hospital▲◦..... Gen	Church		65	33	15	245	1,043
Nazarene Missionary Sanitar- ium and Institute (Samar- itan Hospital)◦..... Gen	Church		45	28	6	106	935
Orofino, 1,078—Clearwater							
Orofino Hospital..... Gen	Part		41	20	4	59	453
Pocatello, 16,471—Bannock							
Pocatello General Hospital▲◦ Gen	County		60	50	15	331	1,927
St. Anthony Mercy Hosp.▲◦. Gen	Church		65	30	15	390	1,393
Potlatch, 800—Latah							
Potlatch Hospital..... Gen	Part		21	8	3	47	425
Preston, 3,381—Franklin							
General Memorial Hospital.. Gen	NPAasn		17	10	10	162	395
Rexburg, 3,048—Madison							
Harlo B. Rigby Hospital.... Gen	Indiv		15	6	6	60	350
Rupert, 2,250—Minidoka							
Rupert General Hospital.... Gen	Indiv		12	5	2	36	309
St. Maries, 1,996—Benewah							
St. Maries Hospital..... Gen	Part		30	9	3	21	232
Sandpoint, 3,290—Bonner							
Community Hospital..... Gen	Indiv		25	...	5	Reopened	
Graham Hospital..... Gen	Indiv		25	15	4	100	600
Soda Springs, 831—Caribou							
Caribou County Hospital... Gen	County		36	19	2	50	1,034
Twin Falls, 8,757—Twin Falls							
Twin Falls County General Hospital..... Gen	County		65	59	15	364	2,501
Wallace, 3,634—Shoshone							
Providence Hospital▲..... Gen	Church		54	29	10	150	1,033
Wallace Hospital..... Gen	Part		40	16	5	49	709
Wendell, 725—Gooding							
St. Valentine's Hospital.... Gen	Church		24	7	9	83	443
Related Institutions							
Blackfoot, 3,199—Bingham							
State Hospital, South◦..... Ment	State		600†	545	..	...	202
Boise, 21,544—Ada							
Salvation Army Women's Home and Hospital..... Mat	Church		32	21	17	233	261
Coeur d'Alene, 8,297—Kootenai							
Community Hospital..... Gen	Indiv		16	8	1	14	205
Moscow, 4,476—Latah							
University of Idaho In- firmary..... Inst	State		30	14	..	...	1,071
Nampa, 8,206—Canyon							
State School and Colony.... McDe	State		570†	555	..	...	23
Orofino, 1,078—Clearwater							
State Hospital, North..... Ment	State		405†	387	..	...	107
Priest River, 949—Bonner							
Priest River Hospital..... Gen	Indiv		10	1	2	9	79

ILLINOIS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Alton, 30,151—Madison							
Alton Memorial Hospital* ¹⁰	Gen	Church	81	60	15	338	2,304
Alton State Hospital.....	Ment	State	1,700 ¹	1,565	..	..	1,679
St. Anthony's Infirmary and Sanitarium.....	Gen	Church	90	35	..	..	346
St. Joseph's Hospital* ¹⁰	Gen	Church	117	70	18	253	3,046
Amboy, 1,972—Lee							
Amboy Public Hospital.....	Gen	NPAasn	20	10	5	61	243
Anna, 3,436—Union							
Anna State Hospital.....	Ment	State	2,375 ¹	2,183	..	..	791
Male-Willard Memorial Hosp. Gen	City	City	11	4	4	32	185
Aurora, 46,589—Kane							
Copley Hospital* ¹⁰	Gen	NPAasn	97	69	20	420	2,015
Kane County Springbrook Sanitarium.....	TB	County	85	74	..	..	69
Mercyville Sanitarium.....	N&M	Church	150	123	..	..	230
St. Charles Hospital* ¹⁰	Gen	Church	120	80	20	289	1,827
St. Joseph Mercy Hospital* ¹⁰	Gen	Church	136	80	30	583	2,634
Batavia, 3,045—Kane							
Bellevue Place Sanitarium... N&M	Corp	Corp	35	19	..	..	7
Fox River Sanitarium.....	TB	NPAasn	85	51	..	..	108
Bellefonte, 28,425—St. Clair							
St. Elizabeth's Hospital.....	Gen	Church	112	73	17	474	2,092
Belvidere, 8,122—Boone							
Highland Hospital.....	Gen	NPAasn	29	12	10	106	500
St. Joseph's Hospital.....	Gen	Church	25	9	9	106	480
Benton, 8,210—Franklin							
Moore Hospital.....	Gen	Indiv	30	10	1	40	506
Berwyn, 47,027—Cook							
Berwyn Hospital.....	Gen	NPAasn	84	51	22	567	2,015
Bloomington, 30,930—McLean							
Memnonite Hospital* ¹⁰	Gen	Church	68	61	14	316	1,960 ¹
St. Joseph's Hospital* ¹⁰	Gen	Church	175	120	25	333	2,516
Blue Island, 16,534—Cook							
St. Francis Hospital* ¹⁰	Gen	Church	85	44	15	447	2,123
Brees, 1,957—Clinton							
St. Joseph Hospital.....	Gen	Church	27	21	6	102	692
Bushnell, 2,850—McDonough							
Elmgrove Sanatorium.....	TB	County	36	33	..	..	51
Calro, 13,532—Alexander							
St. Mary Infirmary* ¹⁰	Gen	Church	100	53	12	144	1,904
Canton, 11,718—Fulton							
Graham Hospital* ¹⁰	Gen	NPAasn	55	41	14	336	2,275
Carbondale, 7,528—Jackson							
Holden Hospital.....	Gen	Church	59	27	10	125	976
Carlinville, 4,144—Macoupin							
Macoupin Hospital.....	Gen	Indiv	26	20	6	39	812
Centralia, 12,583—Marion							
St. Mary's Hospital.....	Gen	Church	70	57	14	340	2,101
Champaign, 20,348—Champaign							
Burnham City Hospital* ¹⁰	Gen	City	110	75	23	420	5,619
Charleston, 8,012—Coles							
Oakwood Hospital.....	Gen	Indiv	20	6	3	21	204
Chicago, 3,677,700—Cook							
Albert Mott Billings Hosp. Unit of University of Chicago Clinics	Gen	Church	250	189	..	..	4,009
Alexian Brothers Hosp.* ¹⁰	Gen	NPAasn	150	70	20	250	3,076
American Hospital* ¹⁰	Gen	Church	275	178	25	554	5,649
Augustana Hospital* ¹⁰	Gen	NPAasn	100	56	25	312	2,294
Belmont Community Hosp.* ¹⁰	Gen	Church	17	9	3	20	246
Bethany Home Hospital.....	Gen	Church	50	28	12	223	1,351
Bethany Sanitarium and Hospital* ¹⁰	Gen	Church	50	28	12	223	1,351
Bohs Roberts Memorial Hospital for Children.....	Unit of University of Chicago Clinics	Indiv	40	9	6	32	333
Burrows Hospital.....	Gen	Indiv	40	9	6	32	333
Chicago Eye, Ear, Nose and Throat Hospital.....	ENT	Corp	75	11	..	..	1,285
Chicago Lying-in Hospital of the Univ. of Chicago* ¹⁰ Unit of University of Chicago Clinics	Gen	NPAasn	88	52	20	281	2,340
Chicago Memorial Hosp.* ¹⁰	Gen	State	4,320 ¹	4,468	..	..	1,211
Chicago State Hospital.....	Ment	NPAasn	252	164	..	..	3,785
Children's Memorial Hosp.* ¹⁰ Chil	Gen	City	1,201	1,188	1	4	1,532
City of Chicago Municipal Tuberculosis Sanit.* ¹⁰	TB	City	150	71	15	348	3,630
Columbus Hospital* ¹⁰	Gen	Church	150	71	15	348	3,630
Cook County Children's Hospital.....	Unit of Cook County Hospital	Gen	2,200	2,217	255	4,533	79,795
Cook County Hospital* ¹⁰	Gen	County	2,200	2,217	255	4,533	79,795
Cook County Psychopathic Hospital.....	Unit of Cook County Hospital	Gen	111	98	29	500	4,280
Edgewater Hospital* ¹⁰	Gen	NPAasn	101	76	25	515	3,507
Englewood Hospital* ¹⁰	Gen	Church	65	29	20	120	811
Evangelical Deaconess Hosp. Gen	Church	Church	175	147	60	1,297	6,774
Evangelical Hospital* ¹⁰	Gen	Corp	69	37	16	291	1,574
Franklin Boulevard Hosp.* ¹⁰ Gen	Corp	NPAasn	150	85	32	578	4,749
Garfield Park Community Hospital* ¹⁰	Gen	NPAasn	220	160	40	887	6,823
Grant Hospital* ¹⁰	Gen	NPAasn	100	73	20	295	2,812
Henrotin Hospital* ¹⁰	Gen	Church	125	92	26	828	4,592
Holy Cross Hospital* ¹⁰	Gen	Church	125	92	26	828	4,592
Home for Destitute Crippled Children.....	Unit of University of Chicago Clinics	Gen	197	125	36	1,031	5,277
Hospital of St. Anthony de Padua* ¹⁰	Gen	NPAasn	250	116	49	588	5,121
Illinois Central Hospital* ¹⁰	Gen	NPAasn	200	153	..	..	5,576
Illinois Eye and Ear Infirmary* ¹⁰	ENT	State	120	105	25	440	3,821
Illinois Masonic Hospital* ¹⁰ Gen	Corp	Corp	182	53	40	321	2,495
Jackson Park Hospital* ¹⁰	Gen	Corp	182	53	40	321	2,495

ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
John B. Murphy Hospital* ¹⁰ .. Gen	Church	Church	100	40	16	26	150
Kenner Hospital.....	Gen	NPAasn	40	11	6	4	47
LaRabida Jackson Park Sanitarium.....	CardChil	NPAasn	100	50	..	..	11
Lewis Memorial Maternity Hospital* ¹⁰	Mat	Church	117	61	117	2,100	250
Loretto Hospital* ¹⁰	Gen	Church	137	71	26	67	284
Lutheran Deaconess Home and Hospital* ¹⁰	Gen	Church	176	102	42	75	506
Martha Washington Hosp. Gen	NPAasn	NPAasn	66	22	12	50	118
Mercy Hospital-Loyola University Clinics* ¹⁰	Gen	Church	275	207	50	529	6,801
Michael Reese Hospital* ¹⁰	Gen	NPAasn	597	451	71	1,821	15,720
Misericordia Hospital and Home for Infants.....	Mat	Church	17	8	20	357	26
Mother Cabrini Memorial Hospital* ¹⁰	Gen	Church	120	83	20	30	346
Mt. Sinai Hospital* ¹⁰	Gen	NPAasn	176	162	41	99	725
Municipal Contagious Disease Hospital* ¹⁰	Iso	City	428	232	..	..	294
Norwegian-American Hospital* ¹⁰	Gen	NPAasn	138	81	35	61	329
Parkway Sanitarium.....	N&M	NPAasn	50	24	..	..	30
Passavant Memorial Hospital* ¹⁰	Gen	NPAasn	185	142	35	488	5,601
Pinel Sanitarium.....	N&M	NPAasn	50	24	..	..	30
Presbyterian Hospital* ¹⁰	Gen	Church	378	291	34	813	11,850
Provident Hospital* ¹⁰	Gen	NPAasn	142	112	18	62	424
Ravenswood Hospital* ¹⁰	Gen	NPAasn	193	113	40	824	6,092
Research and Educational Hospital* ¹⁰	Gen	State	465	383	31	591	3,881
Roseland Community Hospital* ¹⁰	Gen	Corp	101	71	23	464	2,095
St. Anne's Hospital* ¹⁰	Gen	Church	240	155	60	1,509	7,490
St. Anthony de Padua Hosp. See Hospital of St. Anthony de Padua	Gen	Church	175	111	33	65	636
St. Bernard's Hospital* ¹⁰	Gen	Church	262	171	40	1,096	6,116
St. Elizabeth's Hospital* ¹⁰	Gen	Church	96	10	..	..	57
St. George's Hospital.....	Gen	Church	250	111	40	68	574
St. Joseph's Hospital* ¹⁰	Gen	NPAasn	610	301	49	631	12,000
St. Luke's Hospital* ¹⁰	Gen	NPAasn	610	301	49	631	12,000
St. Mary of Nazareth Hospital* ¹⁰	Gen	Church	222	159	38	1,220	6,435
St. Vincent's Infant and Maternity Hospital* ¹⁰	Mat	Church	40	19	12	22	21
Sarah Morris Hospital for Children.....	Unit of Michael Reese Hospital	Gen	40	19	12	22	21
Shriners Hospital for Crippled Children* ¹⁰	Orth	Frat	60	60	..	..	26
South Chicago Community Hospital* ¹⁰	Gen	NPAasn	86	40	17	238	1,701
South Shore Hospital* ¹⁰	Gen	Corp	125	47	25	432	2,401
Streeter Memorial Hospital. Gen	Corp	Corp	55	12	..	..	47
Surgical Institute for Crippled Children.....	Unit of Research and Educational Hosp	Gen	185	113	42	1,621	4,650
Swedish Covenant Hosp.* ¹⁰	Gen	USPHS	301	197	..	..	2,778
U. S. Marine Hospital* ¹⁰	Gen	NPAasn	100	70	21	221	445
University of Chicago Clinics* ¹⁰	Gen	NPAasn	520	408	162	2,631	10,755
Walther Memorial Hosp.* ¹⁰	Gen	Church	200	85	35	619	4,098
Washington Boulevard Hospital* ¹⁰	Gen	NPAasn	100	61	10	116	2,221
Wesley Memorial Hosp.* ¹⁰	Gen	Church	217	85	15	296	2,222
Women and Children's Hospital* ¹⁰	Gen	NPAasn	125	54	25	472	2,401
Woodlawn Hospital* ¹⁰	Gen	NPAasn	85	63	22	310	3,116
Chicago Heights, 23,221—Cook							
St. James Hospital* ¹⁰	Gen	Church	100	52	20	370	2,067
Clinton, 5,920—De Witt							
Dr. John Warner Hospital.. Gen	City	City	25	22	4	102	791
Compton, 277—Lee							
Compton Hospital.....	Gen	Indiv	10	4	2	..	137
Danville, 35,765—Vernilion							
Lake View Hospital* ¹⁰	Gen	NPAasn	145	101	25	241	2,190
St. Elizabeth Hospital* ¹⁰	Gen	Church	150	110	25	622	3,663
Veterans Admin. Facility* ¹⁰ .. Ment	Vet	Vet	1,405	1,700	..	..	212
Deatur, 57,510—Macon							
Deatur and Macon County Hospital* ¹⁰	Gen	NPAasn	140	118	25	602	4,090
Macon County Tuberculosis Sanitarium* ¹⁰	TB	County	89	65	..	..	96
St. Mary's Hospital.....	Gen	Church	177	131	25	541	4,001
Wabash Employes' Hospital* ¹⁰ Indus	NPAasn	NPAasn	75	45	..	..	1,190
De Kalb, 8,545—De Kalb							
De Kalb County Tuberculosis Sanitarium.....	TB	County	35	27	..	..	4
De Kalb Public Hospital* ¹⁰	Gen	City	35	20	8	161	84
St. Mary's Hospital* ¹⁰	Gen	Church	49	15	8	85	503
Des Plaines, 8,770—Cook							
Northwestern Hospital.....	Gen	NPAasn	14	8	5	50	225
Dixon, 9,908—Lee							
Dixon Public Hospital* ¹⁰	Gen	NPAasn	60	45	10	231	1,277
Downey, —Lake							
Veterans Admin. Facility* ¹⁰ .. Ment	Vet	Vet	1,125	1,100	..	..	16
Du Quoin, 7,700—Perry							
Marshall Browning Hosp. Gen	NPAasn	NPAasn	47	21	8	120	791
Dwight, 2,251—Livingston							
Veterans Admin. Facility* ¹⁰ .. Gen	Vet	Vet	225	200	..	..	1,500
East Moline, 19,107—Rock Island							
East Moline State Hospital Ment	State	State	2,271	2,151	..	..	90

ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admis- sions †
East St. Louis, 74,347—St. Clair							
Christian Welfare Hosp.▲○ Gen	NPAssn	Church	55	53	8	411	2,187
St. Mary's Hospital▲○..... Gen	Church		260	123	35	606	5,120
Edwardsville, 6,235—Madison							
Madison County Sanat.▲..... TB	County		93	72	..	..	96
Effingham, 4,978—Effingham							
St. Anthony's Hospital..... Gen	Church		80	70	8	184	1,902
Elgin, 35,929—Kane							
Elgin State Hospital+..... Ment	State		4,845 ¹	4,600	..	..	2,226
Resthaven Sanitarium..... N&M	Indiv		85	65	..	..	184
St. Joseph Hospital..... Gen	Church		120	51	15	281	1,747
Sherman Hospital▲○..... Gen	NPAssn		116	87	24	547	3,516
Elmhurst, 14,035—Du Page							
Elmhurst Community Hosp.▲ Gen	NPAssn		90	61	20	404	2,637
Evanston, 63,338—Cook							
Evanston Community Hosp. Gen	NPAssn		25	11	4	20	320
Evanston Hospital+▲○..... Gen	NPAssn		228	175	32	909	9,221
St. Francis Hospital▲○..... Gen	Church		303	132	50	849	9,292
Evergreen Park, 1,594—Cook							
Little Company of Mary Hospital▲○..... Gen	Church		156	121	51	1,294	5,455
F..... Gen	Army		160	139	6	36	2,871
F..... Gen	Church		84	46	16	307	2,193
St. Francis Hospital▲○..... Gen	Church		97	70	16	264	2,516
Galesburg, 28,830—Knox							
Galesburg Cottage Hosp.▲○ Gen	NPAssn		82	57	18	337	1,974
St. Mary's Hospital..... Gen	Church		100	65	15	272	1,814
Geneseo, 3,406—Henry							
J. C. Hammond City Hosp.. Gen	City		25	10	5	105	523
Geneva, 4,607—Kane							
Community Hospital+..... Gen	NPAssn		85	35	12	194	1,379
Granite City, 25,130—Madison							
St. Elizabeth Hospital▲○..... Gen	Church		104	75	22	481	2,635
Great Lakes, —Lake							
U. S. Naval Hospital+..... Gen	Navy		331	93	..	..	1,498
Harrisburg, 11,625—Saline							
Harrisburg Hospital..... Gen	Corp		25	9	1	19	301
Herrin Hospital..... Gen	Indiv		35	14	5	74	958
Harvard, 2,988—McHenry							
Harvard Community Hosp. Gen	Part		21	13	8	81	335
Harvey, 16,374—Cook							
Ingalls Memorial Hospital▲. Gen	NPAssn		95	30	25	439	1,600
Herrin, 9,708—Williamson							
Herrin Hospital..... Gen	Indiv		50	30	7	89	995
Highland, 3,319—Madison							
St. Joseph's Hospital..... Gen	Church		80	56	12	218	1,654
Highland Park, 12,203—Lake							
Highland Park Hospital+..... Gen	NPAssn		49	27	17	236	1,444
Hillsboro, 4,435—Montgomery							
Hillsboro Hospital..... Gen	NPAssn		35	18	5	43	460
Hines, —Cook							
Veterans Admin. Facility+▲. Gen	Vet		1,760	1,610	..	..	8,580
Hinsdale, 6,923—Du Page							
Hinsdale Sanitarium and Hospital▲○..... Gen	NPAssn		100	56	13	186	1,500
Jacksonville, 17,747—Morgan							
Jacksonville State Hospital. Ment	State		3,406 ¹	3,274	..	..	868
Morgan County Tuberculosis Sanatorium "Oaklawn"..... TB	County		40	22	..	..	42
Norbury Sanatorium..... N&M	Corp		123	78	..	..	147
Our Saviour's Hospital▲○..... Gen	Church		92	40	12	151	1,571
Passavant Memorial Hosp.▲○ Gen	Church		73	50	12	197	1,703
Joliet, 42,993—Will							
St. Joseph's Hospital+▲○..... Gen	Church		220	175	44	888	5,561
Silver Cross Hospital▲○..... Gen	NPAssn		107	61	20	441	2,352
Will County Tuberculosis Sanatorium..... TB	County		100	76	..	..	58
Kankakee, 20,620—Kankakee							
Kankakee State Hospital..... Ment	State		4,138 ¹	3,805	..	..	710
St. Mary Hospital▲○..... Gen	Church		145	75	22	399	2,368
Kendallworth, 2,501—Cook							
Kendallworth Sanitarium..... N&M	Indiv		40	27	..	..	79
Kewanee, 17,093—Henry							
Kewanee Public Hospital▲○. Gen	NPAssn		54	36	12	202	989
St. Francis Hospital▲○..... Gen	Church		56	32	11	161	834
Lake Forest, 6,554—Lake							
Allee Home Hospital..... Gen	NPAssn		42	13	9	89	643
La Salle, 13,149—La Salle							
St. Mary Hospital▲○..... Gen	Church		85	50	15	309	1,710
Libertyville, 3,791—Lake							
Condell Memorial Hospital.. Gen	NPAssn		25	16	6	93	503
Lincoln, 12,855—Logan							
Evangelical Deaconess Hos- pital○..... Gen	Church		32	41	8	186	1,878
St. Clara's Hospital..... Gen	Church		67	39	10	120	1,017
Litchfield, 6,612—Montgomery							
St. Francis Hospital..... Gen	Church		125	88	15	215	3,230
Mackinaw, 760—Tazewell							
Oak Knoll Sanatorium..... TB	County		45	20	..	..	44
Macomb, 8,700—McDonough							
Marietta Phelps Hospital..... Gen	NPAssn		45	25	6	125	842
St. Francis Hospital○..... Gen	Church		100	48	10	184	1,793
Manteno, 1,149—Kankakee							
Manteno State Hospital..... Ment	State		6,083 ¹	5,217	..	..	2,649
Mattoon, 14,631—Coles							
Memorial Methodist Hosp. Gen	Church		43	34	10	142	1,364
Melrose Park, 10,741—Cook							
Westlake Hospital▲..... Gen	NPAssn		75	36	16	306	1,374

ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admis- sions †
Mendota, 4,003—La Salle							
Harris Hospital..... Gen	Part		16	4	4	80	447
Moline, 32,236—Rock Island							
Lutheran Hospital▲..... Gen	Church		135	62	36	412	2,145
Moline Public Hospital+▲○. Gen	City		138	99	31	757	4,195
Monmouth, 8,666—Warren							
Monmouth Hospital..... Gen	City		58	34	15	177	1,195
Morris, 5,568—Grundy							
Morris Hospital..... Gen	NPAssn		40	25	14	213	715
Moweaqua, 1,478—Shelby							
Moweaqua Hospital..... Gen	Indiv		25	14	8	39	146
Murphysboro, 8,182—Jackson							
St. Andrew's Hospital▲..... Gen	Church		35	23	6	75	953
Naperville, 5,118—Du Page							
Edward Sanatorium▲..... TB	NPAssn		97	85	..	..	232
Normal, 6,768—McLean							
Brokaw Hospital▲○..... Gen	Church		92	54	15	207	2,602
Fairview Sanatorium..... TB	County		57	48	..	..	33
North Riverside (Riverside P.O.), 969—Cook							
Municipal Tuberculosis Sanitarium—North Riverside Division..... TB	City		250	235	..	..	324
Oak Forest, 825—Cook							
Cook County Infirmary..... GenChr	County		1,054	1,016	..	..	1,725
(Became branch of Cook County Hospital, January 1940)							
Cook County Tuberculosis Hospital..... TB	County		634	465	3	1	470
Oak Park, 63,982—Cook							
Oak Park Hospital+▲○..... Gen	Church		130	87	40	721	4,750
West Suburban Hospital+▲○ Gen	NPAssn		312	171	100	1,430	8,842
Olney, 6,140—Richland							
Olney Sanitarium○..... Gen	Corp		70	..	..	..	No data supplied
Ottawa, 15,094—La Salle							
Highland..... TB	County		54	54	..	..	52
Ottawa Tuberculosis Sanat.. TB	Corp		133	125	..	..	137
Byburn Memorial Hosp.▲○. Gen	City		88	51	20	377	2,307
Pana, 5,835—Christian							
Huber Memorial Hospital○.. Gen	Church		35	23	6	72	813
Paris, 8,781—Edgar							
Paris Hospital○..... Gen	Corp		100	75	10	31	2,737
Pekin, 16,129—Tazewell							
Pekin Public Hospital..... Gen	NPAssn		53	42	12	349	1,510
Peoria, 104,969—Peoria							
John C. Proctor Hospital○. Gen	NPAssn		92	72	18	320	2,370
Methodist Hospital of Cen- tral Illinois+▲○..... Gen	Church		200	153	40	1,031	6,226
Michell Farm..... N&M	Indiv		25	16	..	..	37
Peoria Municipal Tubercu- losis Sanitarium+▲..... TB	City		103	94	..	..	195
Peoria Sanitarium..... N&M	Indiv		25	17	..	..	87
Peoria State Hospital○..... Ment	State		2,787 ¹	2,492	..	..	894
St. Francis Hospital+▲○..... Gen	Church		350	255	52	1,264	9,255
Peru, 9,121—La Salle							
Peoples Hospital○..... Gen	NPAssn		48	38	10	102	900
Pontiac, 8,272—Livingston							
Livingston County Sanat... TB	County		40	30	..	..	35
St. James' Hospital..... Gen	Church		40	18	12	210	848
Princeton, 4,762—Bureau							
Julia Rackley Perry Me- morial Hospital..... Gen	City		58	30	10	197	1,226
Quincy, 39,241—Adams							
Blessing Hospital▲○..... Gen	NPAssn		105	72	25	349	2,868
Hillcrest..... TB	County		50	40	..	..	50
St. Mary Hospital+▲○..... Gen	Church		195	127	20	522	4,425
Rantoul, 1,355—Champaign							
Station Hospital..... Gen	Army		50	47	1	2	1,067
Red Bud, 1,208—Randolph							
St. Clement's Hospital..... Gen	Church		14	9	4	27	249
Robinson, 3,668—Crawford							
Robinson Hospital..... Gen	Part		18	5	5	31	188
Rockford, 85,864—Winnebago							
Elmlawn (Wilgus Sanit.)..... N&M	Indiv		35	19	..	..	116
Rockford Hospital▲○..... Gen	NPAssn		84	48	18	259	2,233
Rockford Municipal Tuber- culosis Sanatorium+▲○..... TB	City		120	104	..	..	163
St. Anthony's Hospital+▲○. Gen	Church		225	135	36	719	4,939
Swedish-American Hosp.▲○. Gen	NPAssn		75	51	15	358	1,904
Winnebago County Hosp..... GenIso	County		72	52	6	44	1,176
Rock Island, 37,935—Rock Island							
Rock Island County Tuber- culosis Sanatorium..... TB	County		75	66	..	..	82
St. Anthony's Hospital+▲○. Gen	Church		200	78	24	361	2,724
Rosiclare, 1,794—Hardin							
Rosiclare Hospital..... Gen	Indiv		17	6	2	30	246
Rushville, 2,388—Schuyler							
Culbertson Hospital..... Gen	Indiv		27	6	3	15	192
St. Charles, 3,377—Kane							
St. Charles City Hospital... Gen	NPAssn		20	6	6	60	300
Savanna, 5,086—Carroll							
Savanna City Hospital..... Gen	City		16	6	5	65	265
Shelbyville, 3,491—Shelby							
Shelby County Memorial Hospital..... Gen	NPAssn		16	10	5	54	296
Springfield, 71,864—Sangamon							
Palmer Sanatorium▲..... TB	Corp		75	65	..	..	80
St. John's Crippled Chil- dren's Home..... Unit of	St. John's Sanitarium						
St. John's Hospital○..... Gen	Church		542	417	45	1,145	11,699
St. John's Sanitarium..... TBOr	Church		300	233	..	..	489
Springfield Hospital▲○..... Gen	NPAssn		100	96	15	417	3,541

ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Spring Valley, 5,270—Bureau							
St. Margaret's Hospital.....	Gen	Church	78	68	12	235	2,116
Sterling, 10,012—Whiteside							
Home Hospital.....	Gen	NPAasn	25	19	6	23	588
Public Hospital*.....	Gen	City	57	28	14	203	1,574
Streator, 14,728—La Salle							
St. Mary's Hospital.....	Gen	Church	125	80	16	437	2,965
Sublette, 261—Lee							
Angear Maternity Hospital, Mat	Indiv		10	3	10	40	306
Sycamore, 4,021—De Kalb							
Sycamore Municipal Hospital Gen	City		28	11	12	91	521
Taylorville, 7,316—Christian							
St. Vincent Hospital.....	Gen	Church	63	49	12	252	1,625
Tuscola, 2,569—Douglas							
Douglas County Jarman							
Hospital.....	Gen	County	35	24	5	132	887
Urbana, 13,060—Champaign							
Charles Memorial Hospital*.....	Gen	Corp	40	30	10	119	1,420
Champaign County Hospital Gen	County		62	35	10	109	973
Mersey Hospital*.....	Gen	Church	60	50	12	253	2,011
The Outlook.....	TB	County	44	41	..	..	31
Vandalia, 4,342—Fayette							
Mark Greer Hospital.....	Gen	Indiv	30	18	8	102	906
Waterman, 520—De Kalb							
East Side Hospital.....	Gen	Indiv	25	13	7	44	319
Watseka, 3,144—Iroquois							
Iroquois Hospital.....	Gen	NPAasn	41	32	11	260	1,413
Waukegan, 33,499—Lake							
Lake County General Hosp. Gen	County		89	73	12	100	1,615
Lake County Tuberculosis							
Sanatorium.....	TB	County	100	..	..	Estab. 1939	
St. Therese's Hospital*.....	Gen	Church	150	72	21	405	2,702
Victory Memorial Hospital* Gen	NPAasn		76	47	14	346	2,229
Winfield, 445—Du Page							
Winfield Sanatorium.....	TB	NPAasn	110	76	..	..	136
Zane Sanatorium.....	TB	NPAasn	50	35	..	..	60
Woodstock, 5,471—McHenry							
Woodstock Public Hospital, Gen	NPAasn		45	18	12	177	890
Zeigler, 3,616—Franklin							
Zeigler Hospital.....	Gen	NPAasn	14	3	2	..	88

Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Arrowsmith, 297—McLean							
L. M. Johnson Hospital.....	Gen	Indiv	10	1	2	12	58
Avon, 790—Fulton							
Saunders' Hospital.....	Gen	NPAasn	13	5	4	46	170
Chicago, 3,677,700—Cook							
Beverly Hills Rest Home.....	Conv	Indiv	12	8	..	..	28
Chicago Home for Conva-							
lescent Women and Chil-							
dren.....	Conv	NPAasn	41	37	..	..	216
Chicago Home for Incur-							
ables.....	Incur	NPAasn	280	270	..	..	78
House of Correction Hosp., Inst.	City		75	30	..	..	1,130
Isolation Hospital.....	SmPox	City	35	..	..	..	14
Jones Nursing Home.....	Conv	Indiv	15	9	..	..	53
Long's Convalescent Home, N&M	Indiv		24	14	..	..	60
North Side Rest Home.....	N&M	Part	10	2	..	..	12
Parkway Lodge Conva-							
lescent Home for Men and							
Women.....	Conv	FedCy	270	211	..	..	1,107
Salvation Army Booth Me-							
morial Hospital.....	Mat	Church	21	14	12	217	265
Washington and Jane Smith							
Home.....	InstGen	NPAasn	21	9	..	..	98
Danvers, 510—McLean							
Willow Bark Hospital.....	Alcoh	Corp	10	4	..	..	41
Decatur, 57,510—Macon							
City Public Hospital.....	Iso	City	26	8	..	..	141
Dixon, 9,908—Lee							
Dixon State Hospital.....	MeDe	State	4,419 ¹	3,689	..	..	895
Eldorado, 4,42—Saline							
Ferrell Hospital.....	Gen	Indiv	12	5	2	24	276
Evanston, 61,338—Cook							
Grove House for Conva-							
lescents.....	Conv	NPAasn	26	21	..	..	190
The Cradle.....	Chil	NPAasn	36	30	..	..	223
Virginia Hall Nursing Home, Conv	Part		30	25	..	..	39
Fairbury, 2,310—Livingston							
Fairbury Hospital.....	Gen	NPAasn	11	7	5	119	451
Geneva, 4,927—Kane							
State Training School for							
Girls.....	Inst	State	25	17	15	23	297
Godfrey, 130—Madison							
Beverly Farm.....	MeDe	Corp	72	66	..	..	16
Henry, 1,638—Marshall							
Dr. Coggeshall and Dysart							
Hospital.....	Gen	Part	7	3	4	26	159
Lincoln, 12,33—Logan							
Lincoln State School and							
Colony.....	MeDe	State	4,371 ¹	4,014	4	4	427
Mattoon, 14,631—Coles							
Independent Order Odd Fel-							
lows Old Folks Home							
Hospital.....	Inst	Frat	55	35	..	..	132
Menard, 22—Randolph							
Illinois Security Hospital.....	Ment	State	309 ¹	415	..	..	41
Prison Hospital of Illinois							
State Penitentiary.....	Inst	State	53	45	..	..	531

ILLINOIS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Metropolis, 5,573—Massac							
Fisher Hospital.....	Gen	Indiv	10	..	..	..	Not data supplied
Minonk, 1,910—Woodford							
Woodford County Tubercu-							
losis Sanatorium.....	TB	County	12	6	..	..	11
Mooseheart, 1,400—Kane							
Philadelphia Memorial Hos-							
pital.....	InstChil	Frat	65	33	..	..	134
Normal, 6,768—McLean							
Soldiers' and Sailors' Chil-							
dren's School Hospital.....	Inst	State	105	20	..	..	124
Paxton, 2,892—Ford							
Paxton Community Hosp... Gen	NPAasn		19	8	4	7	6
Pontiac, 8,272—Livingston							
Illinois State Penitentiary							
Hospital.....	Inst	State	120	25	..	..	135
Princeton, 994—Peoria							
Seven Oaks Rest Home and							
Hospital.....	Gen	Indiv	14	6	4	27	5
Quincy, 39,241—Adams							
Quincy Memorial Sanitarium Conv	NPAasn		16	7	..	..	14
St. Charles, 5,377—Kane							
Illinois State Training School							
for Boys.....	Inst	State	25	21	..	..	132
Urbana, 13,060—Champaign							
McKinley University Hosp... Inst	State		135	52	..	..	222
Wedron, 202—La Salle							
St. Joseph's Health Resort... Conv	Church		75	42	..	..	78
West Chicago, 3,477—Du Page							
Country Home for Conva-							
lescent Crippled Children... Orth	NPAasn		120	66	..	..	16
Wheaton, 7,258—Du Page							
Mary E. Pogue School.....	MeDe	Indiv	49	36	..	..	9
Wheeling, 467—Cook							
Wheeling Hospital.....	Gen	Indiv	9	1	5	3	11
White Hall, 2,928—Greene							
White Hall Hospital.....	Gen	NPAasn	10	5	5	50	20
Winnetka, 12,166—Cook							
North Shore Health Resort, Conv	Corp		75	37	..	..	14

INDIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anderson, 39,804—Madison							
St. John's Hickey Memorial							
Hospital.....	Gen	Church	110	87	15	479	2,536
Angola, 2,665—Steuben							
Cameron Hospitals.....	Gen	NPAasn	20	10	5	74	65
Argos, 1,211—Marshall							
Kelly Hospital.....	Gen	NPAasn	10	6	6	23	174
Auburn, 5,088—De Kalb							
Dr. Bonnell M. Souder Hosp. Gen	Indiv		20	6	12	53	23
Batesville, 2,835—Ripley							
Margaret Mary Hospital... Gen	Church		40	18	10	162	49
Bedford, 13,208—Lawrence							
Dunn Hospital.....	Gen	NPAasn	25	18	5	126	94
Beech Grove, 3,452—Marion							
St. Francis' Hospital*.....	Gen	Church	140	62	30	221	3,211
Bloomington, 18,227—Monroe							
Bloomington Hospital*.....	Gen	NPAasn	40	23	9	119	122
Bluffton, 5,074—Wells							
Wells County Hospital.....	Gen	County	24	17	6	157	64
Clinton, 7,936—Vermillion							
Vermillion County Hospital, Gen	County		37	29	6	121	93
Columbus, 9,935—Bartholomew							
Bartholomew County Hosp. Gen	County		40	27	9	209	1,140
Connersville, 12,795—Fayette							
Fayette Memorial Hospital, Gen	NPAasn		37	21	10	100	265
Crawfordsville, 10,355—Montgomery							
Culver Hospital*.....	Gen	County	50	44	12	273	1,202
Crown Point, 4,046—Lake							
Lake County Tuberculosis							
Sanatorium*.....	TB	County	251	197	..	..	10
Decatur, 5,156—Adams							
Adams County Memorial							
Hospital.....	Gen	County	31	26	6	165	1,177
East Chicago, 54,784—Lake							
St. Catherine's Hospital*.....	Gen	Church	252	175	69	227	5,610
Elkhart, 22,949—Elkhart							
Elkhart General Hospital... Gen	NPAasn		75	33	10	411	1,574
Elwood, 10,655—Madison							
Mersey Hospital.....	Gen	Church	40	21	15	265	64
Evansville, 102,240—Vanderburgh							
Boehne Tuberculosis Hosp.*.....	TB	County	139	122	..	..	27
Evansville State Hospital... Ment	State		1,209 ¹	1,159	..	..	27
Protestant Deaconess Hos-							
pital*.....	Gen	Church	165	139	29	62	5,555
St. Mary's Hospital*.....	Gen	Church	125	96	15	248	4,214
U. S. Marine Hospital*.....	Gen	USPHS	169	53	..	..	70
Wellborn-Walker Hospital*.....	Gen	Corp	111	75	12	151	2,244
Fort Benjamin Harrison, —Marion							
Station Hospital*.....	Gen	Army	165	129	4	23	2,754
Fort Wayne, 114,596—Allen							
Irene Byron Sanatorium.....	TB	Counties	252	224	..	..	61
Lutheran Hospital*.....	Gen	Church	165	114	25	524	1,674

INDIANA—Continued

REGISTERED HOSPITALS

1209

Hospitals and Sanatoriums

Type of
Service
Ownership
or Control

Beds

Average
Census †

Bathrooms

Number of
BirthsAdmis-
sions †

Methodist Episcopal Hosp.▲ Gen	Church	87	50	22	238	1,640
St. Joseph Hospital▲ Gen	Church	248	142	52	773	4,753
Frankfort, 12,196—Clinton	County	43	19	10	181	898
Clinton County Hospital▲ Gen	County	42	22	6	48	706
3arrett, 4,428—De Kalb	County	100	85	15	660	3,236
Sacred Heart Hospital▲ Gen	Church	17	7	6	27	392
Gary, 100,426—Lake	County	207	167	45	1,312	7,200
Methodist Hospital▲ Gen	County	46	22	8	115	1,355
St. John Hospital▲ Gen	County	25	17	6	103	647
St. Mary's Hospital▲ Gen	County	32	30	..	..	153
Greencastle, 4,613—Putnam	County	215	130	50	1,168	5,110
Putnam County Hospital▲ Gen	County	30	14	5	170	510
Greensburg, 5,702—Decatur	County	26	19	6	129	732
Decatur County Memorial	County	1,962	1,935	..	..	663
Hospital▲ Gen	County	50	25	..	..	108
Hammond, 64,560—Lake	County	677	522	41	856	11,671
Mount Mercy Sanitarium▲ N&M	County	566	446	38	1,104	9,790
St. Margaret Hospital▲ Gen	County	520	431	59	1,550	23,917
Hartford City, 6,613—Blackford	County	30	12	..	..	153
Blackford County Hospital▲ Gen	County	285	180	43	1,091	6,873
Huntington, 13,420—Huntington	County	250	237	..	..	179
Huntington County Hospital▲ Gen	County	346	104	..	..	1,633
Indianapolis, 364,161—Marion	County	35	20	6	82	661
Central State Hospital▲ Gen	County	23	18	12	118	664
Dr. W. B. Fletcher's Sana- torium (Neuronhurst)▲ N&M	County	50	14	..	..	261
Flower Mission Memorial	County	100	78	25	359	2,826
Hospital▲ Gen	County	40	35	..	..	4,718
Indianapolis City Hosp.▲ Gen	County	34	20	8	99	600
Indiana University Medi- cal Center▲ Gen	County	58	28	8	175	856
James Whitcomb Riley Hos- pital for Children▲ Gen	County	58	38	10	167	1,724
Kiwanis Home▲ Gen	County	2,045	1,855	..	..	432
Methodist Hospital▲ Gen	County	60	32	10	122	1,073
"Norways" Sterne Memorial	County	50	20	6	62	1,074
Hospital▲ Gen	County	38	7	..	..	281
Robert W. Long Hospital▲ Gen	County	18	8	5	67	614
Rotary Convalescent Home▲ Gen	County	50	28	12	52	1,531
St. Vincent's Hospital▲ Gen	County	110	44	19	530	1,596
Sunnyside Sanatorium▲ Gen	County	102	57	18	537	2,046
Veterans Admin. Facility▲ Gen	County	215	135	25	720	5,101
William H. Coleman Hos- pital for Women▲ Gen	County	100	48	14	238	2,189
Jeffersonville, 11,946—Clark	County	16	10	6	89	595
Clark County Memorial Hos- pital▲ Gen	County	61	39	9	183	1,345
Kendallville, 5,439—Noble	County	1,580	1,677	..	..	278
Lakeside Hospital▲ Gen	County	48	39	12	217	1,363
Kokomo, 32,843—Howard	County	50	29	..	..	483
Good Samaritan Hospital▲ Gen	County	35	20	8	16	156
St. Joseph Memorial Hosp.▲ Gen	County	30	16	6	91	570
La Fayette, 26,240—Tippecanoe	County	30	16	6	91	570
St. Elizabeth Home Hosp.▲ Gen	County	30	16	6	91	570
William Ross Sanatorium▲ Gen	County	30	16	6	91	570
La Porte, 16,755—La Porte	County	30	16	6	91	570
Fairview Hospital▲ Gen	County	30	16	6	91	570
Holy Family Hospital▲ Gen	County	30	16	6	91	570
Lebanon, 6,445—Boone	County	30	16	6	91	570
Logansport, 13,508—Cass	County	30	16	6	91	570
Cass County Hospital▲ Gen	County	30	16	6	91	570
Logansport State Hosp.▲ Gen	County	30	16	6	91	570
St. Joseph's Hospital▲ Gen	County	30	16	6	91	570
Kings Daughters Hospital▲ Gen	County	30	16	6	91	570
Marion, 24,496—Grant	County	30	16	6	91	570
Veterans Admin. Facility▲ Gen	County	30	16	6	91	570
Martinsville, 4,962—Morgan	County	30	16	6	91	570
Morgan County Memorial	County	30	16	6	91	570
Hospital▲ Gen	County	30	16	6	91	570
Michigan City, 26,735—La Porte	County	30	16	6	91	570
St. Anthony's Hospital▲ Gen	County	30	16	6	91	570
Mishawaka, 28,630—St. Joseph	County	30	16	6	91	570
St. Joseph Hospital▲ Gen	County	30	16	6	91	570
Muncie, 46,548—Delaware	County	30	16	6	91	570
Ball Memorial Hospital▲ Gen	County	30	16	6	91	570
New Albany, 25,819—Floyd	County	30	16	6	91	570
St. Edward's Hospital▲ Gen	County	30	16	6	91	570
Newcastle, 14,027—Henry	County	30	16	6	91	570
Henry County Hospital▲ Gen	County	30	16	6	91	570
North Madison, 373—Jefferson	County	30	16	6	91	570
Madison State Hospital▲ Gen	County	30	16	6	91	570
Peru, 12,730—Miami	County	30	16	6	91	570
Dukes-Miami Me- morial Hospital▲ Gen	County	30	16	6	91	570
Wabash Railroad Employees	County	30	16	6	91	570
Hospital▲ Gen	County	30	16	6	91	570
Plymouth, 5,230—Marshall	County	30	16	6	91	570
Parkview Hospital▲ Gen	County	30	16	6	91	570
Portland, 5,276—Jay	County	30	16	6	91	570
Jay County Hospital▲ Gen	County	30	16	6	91	570
Princeton, 7,505—Gibson	County	30	16	6	91	570
Methodist Episcopal Hosp.▲ Gen	County	30	16	6	91	570

Key to symbols and abbreviations is on page 1195

INDIANA—Continued

Hospitals and Sanatoriums

Type of
Service
Ownership
or Control

Beds

Average
Census †

Bathrooms

Number of
BirthsAdmis-
sions †

Rensselaer, 2,798—Jasper	County	38	28	10	244	941
Jasper County Hospital▲ Gen	County	126	77	22	420	3,727
Richmond, 32,493—Wayne	County	1,056	1,564	..	..	543
Reld Memorial Hospital▲ Gen	County	57	..	..	..	32
Richmond State Hospital▲ Gen	County	31	10	6	70	583
Smith-Esteb Memorial Hosp. TB	County	250	187	..	..	297
Rochester, 3,518—Fulton	County	9	3	3	73	102
Woodlawn Hospital▲ Gen	County	30	27	6	148	996
Rockville, 1,832—Parke	County	40	20	6	117	857
Indiana State Sanatorium.. TB	County	153	116	37	766	4,827
Rushville, 6,709—Rush	County	215	187	..	..	242
City Hospital▲ Gen	County	128	78	22	694	3,661
Seymour, 7,508—Jackson	County	50	23	7	112	876
Schneck Memorial Hospital▲ Gen	County	12	4	3	26	146
Shelbyville, 10,618—Shelby	County	171	97	26	349	3,249
W. S. Major Hospital▲ Gen	County	178	125	20	451	4,420
South Bend, 104,193—St. Joseph	County	15	9	3	61	440
Epworth Hospital▲ Gen	County	1,509	1,535	..	..	259
Healthwin Hospital▲ Gen	County	92	56	8	128	1,305
St. Joseph Hospital▲ Gen	County	66	32	..	..	57
Sullivan, 5,306—Sullivan	County	40	24	11	194	1,156
Mary Sherman Memorial Hos- pital▲ Gen	County	44	16	8	195	922
Tell City, 4,873—Perry	County	12	7	6	43	355
Parkview Hospital▲ Gen	County	90	38	15	176	1,555
Terre Haute, 62,810—Vigo	County	22	..	4	134	866
St. Anthony's Hospital▲ Gen	County	34	20	4	134	866
Union Hospital▲ Gen	County	50	39	10	196	60
Union City, 3,034—Randolph	County	12	2	10	196	60
Union City Hospital▲ Gen	County	894	861	..	..	263
Veterans Administration Hospital, 2,300—Grant	County	6	4	..	..	228
Veterans Admin. Facility▲ Gen	County	1,930	1,960	..	..	220
Vincennes, 17,564—Knox	County	23	15	9	156	502
Good Samaritan Hospital▲ Gen	County	30	25	..	..	883
Hillcrest Tuberculosis Hosp. TB	County	82	65	..	..	90
Wabash County Hospital▲ Gen	County	12	4	..	..	220
Warsaw, 6,730—Kosciusko	County	22	10	20	37	43
McDonald Hospital▲ Gen	County	25	14	..	..	1,492
Murphy Hospital▲ Gen	County	60	20	..	..	720
Washington, 9,070—Davies	County	140	65	..	..	382
Williamsport, 1,053—Warren	County	200	75	..	..	1,126
Maris Hospital▲ Gen	County	100	30	..	..	33
Winchester, 4,457—Randolph	County	15	10	..	..	333
Randolph County Hospital▲ Gen	County	915	..	..	..	No data supplied

Related Institutions

Anderson, 29,804—Madison	County	50	39	10	196	60
Ella B. Kyher Hospital▲ TB	County	12	2	10	196	60
Hopkes Lying-In Hospital▲ Mat	County	894	861	..	..	263
Butler, 266—Jennings	County	6	4	..	..	228
Muscatatuck Colony	County	1,930	1,960	..	..	220
Evansville, 102,249—Vanderburgh	County	23	15	9	156	502
French Hospital▲ Gen	County	30	25	..	..	883
Fort Wayne, 114,946—Allen	County	82	65	..	..	90
Fort Wayne State School... McDe	County	12	4	..	..	220
Grace Convalescent Hosp... Conv	County	22	10	20	37	43
Medical Center Hospital▲ Gen	County	25	14	..	..	1,492
Greencastle, 4,613—Putnam	County	60	20	..	..	720
Indiana State Farm Hosp... Inst	County	140	65	..	..	382
Odd Fellows Home Hospital Inst	County	200	75	..	..	1,126
Indianapolis, 364,161—Marion	County	100	30	..	..	33
Suemma Coleman Orphan Asylum Inst	County	15	10	..	..	333
Knightsdown, 2,209—Henry	County	915	..	..	..	No data supplied
Indiana Sailors' and Soldiers'	County	100	67	..	..	3,270
Children's Home▲ Gen	County	21	4	..	..	253
Kramer, 1,200—Warren	County	175	..	..	..	700
Mudavia Springs Hotel and	County	10	3	2	15	373
Sanitarium▲ Gen	County	7	1	..	..	213
La Fayette, 26,240—Tippecanoe	County	..	..	..	..	..
Indiana State Soldiers' Home	County	..	..	..	..	..
Hospital▲ Gen	County	..	..	..	..	..
Martinsville, 4,962—Morgan	County	..	..	..	..	..
Home Lawn Mineral Springs. Conv	County	..	..	..	..	..
Martinsville Sanitarium▲ Gen	County	..	..	..	..	..
Michigan City, 26,735—La Porte	County	..	..	..	..	..
Indiana Hospital for In- sane Criminals▲ Gen	County	..	..	..	..	..
Indiana State Prison Hosp. Inst	County	..	..	..	..	..
Moore'sville, 1,910—Morgan	County	..	..	..	..	..
Comer's Sanitarium▲ Gen	County	..	..	..	..	..
Newcastle, 14,027—Henry	County	..	..	..	..	..
Indiana Village for Epi- leptics▲ Gen	County	..	..	..	..	..
Pendleton, 1,538—Madison	County	..	..	..	..	..
Indiana State Reformatory	County	..	..	..	..	..
Hospital▲ Gen	County	..	..	..	..	..
Plainfield, 1,617—Hendricks	County	..	..	..	..	..
Indiana Boys School Hosp.. Inst	County	..	..	..	..	..
Rome City, 300—Noble	County	..	..	..	..	..
Kneipp Springs Sanatorium Conv	County	..	..	..	..	..
Terre Haute, 62,810—Vigo	County	..	..	..	..	..
Hoover's Sanatorium▲ Gen	County	..	..	..	..	..
Wilkinson, 316—Hancock	County	..	..	..	..	..
Dr. Charles Titus Hospital.. ENT	County	..	..	..	..	..

IOWA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Akron, 1,304—Plymouth	Gen	Indiv	14	4	3	37	212
Albia, 4,423—Monroe	Gen	Indiv	25	10	5	18	521
Alcona, 3,985—Kossuth	Gen	Indiv	31	16	5	128	547
Alta, 1,297—Buena Vista	Gen	NPAasn	15	7	5	32	188
Alta Community Hospital..	Gen	Church	30	15	9	134	640
Anamosa, 3,579—Jones	Gen	Church	42	17	8	103	739
Atlantic, 5,585—Cass	Gen	Part	17	7	3	19	246
Battle Creek, 804—Ida	Gen	County	28	21	10	277	1,004
Battle Creek Hospital.....	Gen	Church	125	84	20	213	2,297
Boone, 11,886—Boone	Gen	Church	125	54	20	218	1,612
Boone County Hospital.....	Gen	Church	50	33	25	146	879
Burlington, 26,755—Des Moines	Gen	Church	108	65	22	437	2,526
Burlington Protestant Hos- pital..	Gen	City	37	17	8	168	691
Mersey Hospital..	Gen	Church	157	93	20	524	3,236
St. Francis Hospital.....	Gen	Church	120	83	20	538	4,000
Carroll, 4,691—Carroll	Gen	Church	47	29	6	156	1,498
St. Anthony Hospital..	Gen	Indiv	16	13	5	37	505
Cedar Falls, 7,362—Black Hawk	Gen	City	48	26	11	182	1,114
Sartori Memorial Hospital..	Gen	State	1,700 ¹	1,676	..	..	413
Cedar Rapids, 56,097—Linn	Gen	NPAasn	35	26	12	210	1,744
Mersey Hospital..	Gen	Church	120	83	20	538	4,000
St. Luke's Methodist Hos- pital..	Gen	Church	120	83	20	538	4,000
Centerville, 8,147—Appanoose	Gen	Church	47	29	6	156	1,498
St. Joseph's Mercy Hosp..	Gen	Indiv	16	13	5	37	505
Chariton, 5,365—Lucas	Gen	City	48	26	11	182	1,114
Yocom Hospital	Gen	State	1,700 ¹	1,676	..	..	413
Charles City, 8,039—Floyd	Gen	NPAasn	35	26	12	210	1,744
Cedar Valley Hospital.....	Gen	Church	120	83	20	538	4,000
Cherokee, 6,443—Cherokee	Gen	Church	47	29	6	156	1,498
Cherokee State Hospital....	Ment	State	1,700 ¹	1,676	..	..	413
Sioux Valley Hospital.....	Gen	NPAasn	35	26	12	210	1,744
Clarinda, 4,962—Page	Gen	Church	120	83	20	538	4,000
Clarinda State Hospital.....	Ment	State	1,700 ¹	1,689	..	..	508
Clinton, 25,726—Claton	Gen	Church	47	29	6	156	1,498
Jane Lamb Memorial Hosp..	Gen	Indiv	16	13	5	37	505
St. Joseph Mercy Hospital..	Gen	City	48	26	11	182	1,114
Colfax, 2,213—Jasper	Gen	State	1,700 ¹	1,676	..	..	413
Colfax Sanitarium	Gen	NPAasn	35	26	12	210	1,744
Council Bluffs, 42,048—Pottawattamie	Gen	Church	120	83	20	538	4,000
Jennie Edmundson Memorial Hospital..	Gen	Church	120	83	20	538	4,000
Mersey Hospital..	Gen	Church	120	83	20	538	4,000
St. Bernard's Hospital..	N&M	Church	180	140	..	..	213
Cresco, 3,009—Howard	Gen	Church	35	11	8	106	484
St. Joseph Mercy Hospital..	Gen	County	50	20	11	86	1,031
Creston, 8,615—Union	Gen	Church	125	90	20	682	3,553
Greater Community Hosp...	Gen	County	111	75	..	..	98
Davenport, 60,751—Scott	Gen	Church	80	56	20	498	2,425
Mersey Hospital..	Gen	County	50	20	11	86	1,031
Pine Knoll Sanitarium.....	TB	Church	80	56	20	498	2,425
St. Elizabeth's and St. John's Hospitals.....	Unit of Mercy	Church	80	56	20	498	2,425
St. Luke's Hospital..	Gen	Church	80	56	20	498	2,425
Decorah, 4,581—Winnebago	Gen	NPAasn	32	18	8	139	755
Decorah Hospital..	Gen	Indiv	15	6	3	26	366
Denison, 3,905—Crawford	Gen	County	102	122	16	468	4,917
Denison Hospital	Gen	County	49	14	..	..	478
Des Moines, 142,559—Polk	Gen	County	100	61	..	..	91
Broadlawns Polk County Public Hospital..	Gen	County	125	90	20	441	4,222
Broadlawns Polk County Public Hospital.....	Gen	County	220	180	40	885	8,084
Broadlawns Polk County Public Hospital.....	Gen	County	163	121	24	566	4,550
Iowa Lutheran Hospital..	Gen	Corp	50	36	..	..	130
Iowa Methodist Hospital..	Gen	Vet	200	268	..	..	2,644
Mersey Hospital..	Gen	Church	91	43	10	225	1,524
The Retreat	N&M	Church	125	94	25	476	2,676
Veterans Admin. Facility..	Gen	County	200	201	..	..	553
Dubuque, 41,679—Dubuque	Gen	County	70	68	..	..	76
Finley Hospital..	Gen	City	22	..	6	Estab.	1929
St. Joseph Mercy Hosp..	Gen	County	13	8	6	49	329
St. Joseph Sanitarium.....	N&M	County	25	19	6	170	1,028
Sunny Crest Sanitarium..	TB	County	24	18	6	148	945
Eldora, 3,200—Hardin	Gen	Indiv	15	9	5	129	520
Eldora Memorial Hospital..	Gen	Army	60	75	4	46	2,005
Emmettburg, 2,565—Palo Alto	Gen	Church	100	54	20	255	2,005
Palo Alto Hospital.....	Gen	Church	125	67	18	318	2,818
Estherville, 4,440—Emmett	Gen	Church	125	67	18	318	2,818
Coleman Hospital	Gen	Church	125	67	18	318	2,818
Fairfield, 6,613—Jefferson	Gen	Church	125	67	18	318	2,818
Jefferson County Hospital..	Gen	Church	125	67	18	318	2,818
Forest City, 2,016—Winnebago	Gen	Church	125	67	18	318	2,818
Irish Hospital	Gen	Church	125	67	18	318	2,818
Fort Des Moines, 2,000—Polk	Gen	Church	125	67	18	318	2,818
Station Hospital.....	Gen	Church	125	67	18	318	2,818
Fort Dodge, 21,895—Webster	Gen	Church	125	67	18	318	2,818
Lutheran Hospital..	Gen	Church	125	67	18	318	2,818
St. Joseph Mercy Hosp..	Gen	Church	125	67	18	318	2,818

IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Discharges	Number of Births	Admissions †
Fort Madison, 13,779—Lee							
Atchison, Topeka and Santa Fe Railway Employees' Hospital	Indus	NPAasn	40	11	..	..	..
Sacred Heart Hospital.....	Gen	Church	69	29	12	138	1,070
Grinnell, 4,949—Poweshiek							
Grinnell Community Hosp.▲	Gen	NPAasn	54	18	6	118	78
St. Francis Hospital.....	Gen	Church	40	20	10	61	52
Hamburg, 2,103—Fremont							
Hamburg Hospital	Gen	Indiv	18	9	3	45	72
Hampton, 3,473—Franklin							
Lutheran Hospital	Gen	Church	46	27	8	127	1,371
Hartley, 1,272—O'Brien							
Hand Hospital	Gen	Indiv	12	5	3	46	29
Hull, 905—Sioux							
Hull Hospital	Gen	Corp	15	10	3	22	43
Ida Grove, 2,206—Ida							
Ida Grove General Hospital	Gen	Part	12	4	4	26	13
Independence, 3,691—Buchanan							
Independence State Hospital	Ment	State	1,608 ¹	1,727	..	..	56
Peoples Hospital	Gen	NPAasn	30	20	8	149	84
Iowa City, 15,340—Johnson							
Children's Hospital.....	Unit of	University Hospitals					
Iowa State Psychopathic Hospital+	Ment	State	50 ¹	41	..	..	33
Mersey Hospital▲.....	Gen	Church	100	66	20	220	1,293
University Hospitals*+▲.....	Gen	State	900	693	54	1,320	1,351
Iowa Falls, 4,112—Hardin							
Ellsworth Municipal Hosp...	Gen	City	36	19	10	124	1,084
Keokuk, 15,106—Lee							
Graham Protestant Hosp.°	Gen	NPAasn	75	41	10	137	1,540
St. Joseph's Hospital°.....	Gen	Church	110	60	15	257	1,540
Knoxville, 4,697—Marion							
Veterans Admin. Facility▲..	Ment	Vet	1,146	1,016	..	..	28
Lake City, 2,012—Calhoun							
Davidson Hospital	Gen	Indiv	12	9	4	22	24
McCrary Hospital	Gen	Indiv	35	10	6	56	54
McVay Memorial Hospital..	Gen	Part	16	10	5	46	25
Le Mars, 4,788—Plymouth							
Sacred Heart Hospital▲.....	Gen	Church	50	21	10	116	1,061
Leon, 2,000—Decatur							
Decatur County Hospital...	Gen	County	20	13	5	74	66
Manning, 1,817—Carroll							
Wyatt Memorial Hospital..	Gen	NPAasn	16	4	4	22	104
Maquoketa, 3,593—Jackson							
City Memorial Hospital...	Gen	Indiv	18	11	5	49	54
Marshalltown, 17,373—Marshall							
Evangelical Deaconess Home and Hospital°	Gen	Church	150	105	20	354	3,102
St. Thomas Mercy Hospital°	Gen	Church	68	45	15	143	1,137
Mason City, 23,304—Cerro Gordo							
Park Hospital.....	Gen	Corp	52	31	18	211	1,470
St. Joseph's Mercy Hosp.▲°	Gen	Church	68	73	12	490	2,125
McGregor, 1,299—Clayton							
McGregor Hospital	Gen	Indiv	10	5	2	12	112
Monticello, 2,239—Jones							
John McDonald Hospital...	Gen	NPAasn	35	22	7	150	67
Mt. Pleasant, 3,743—Henry							
Mt. Pleasant State Hosp....	Ment	State	1,040 ¹	1,443	..	..	73
Muscatine, 16,778—Muscatine							
Belleuve Hospital	Gen	NPAasn	45	16	8	108	99
Benjamin Hershey Memorial Hospital	Gen	NPAasn	50	22	6	148	1,099
Nevada, 3,133—Story							
Iowa Sanitarium and Hosp.	Gen	Church	35	15	4	87	202
New Hampton, 2,458—Chickasaw							
St. Joseph's Hospital▲.....	Gen	Church	51	24	9	135	1,091
Newton, 11,560—Jasper							
Mary Frances Skiff Memorial Hospital	Gen	City	43	22	9	150	872
Oakdale, —Johnson							
State Sanatorium▲	TB	State	422	410	..	..	251
Oelwein, 7,794—Fayette							
Mersey Hospital	Gen	Church	27	18	7	154	857
Onawa, 2,538—Monona							
Onawa Hospital	Gen	Indiv	25	8	6	29	59
Oseola, 2,871—Clarke							
Harken Hospital	Gen	Indiv	20	9	6	26	49
Oseola Hospital	Gen	Part	20	7	4	45	150
Oseola Sanitarium	Gen	Indiv	20	6	2	16	150
Oskaloosa, 10,122—Mahaska							
Mersey Hospital	Gen	Part	29	15	5	65	664
Ottumwa, 28,075—Wapello							
Ottumwa Hospital	Gen	NPAasn	65	25	12	210	1,751
St. Joseph Hospital.....	Gen	Church	75	54	12	247	1,462
Sunnyslope Sanatorium▲ ...	TB	County	100	91	..	..	89
Perry, 5,851—Dallas							
Kings Daughters' Hospital..	Gen	NPAasn	21	9	5	62	44
Pleasantville, 757—Marion							
Community Hospital	Gen	Indiv	19	5	2	6	147
Rockwell City, 2,106—Calhoun							
Rockwell City Hospital.....	Gen	Indiv	11	..	4	Estab.	1929
Sheldon, 3,320—O'Brien							
Sheldon Good Samaritan Hospital	Gen	Church	15	8	4	31	59
Shenandoah, 6,792—Page							
Hand Memorial Hospital..	Gen	NPAasn	25	22	7	134	1,092

IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Sibley, 1,870—Osceola	Gen	Part	18	9	6	35	408
Osceola Hospital	Gen	Part	18	9	6	35	408
Sigourney, 2,262—Keokuk	Gen	Indiv	11	2	3	10	103
Sigourney Hospital	Gen	Indiv	11	2	3	10	103
Sioux City, 79,183—Woodbury	Gen	Church	85	58	10	236	2,034
Lutheran Hospital*	Gen	Church	110	67	18	371	3,305
Methodist Hospital*	Gen	Church	200	103	20	446	4,337
St. Joseph Mercy Hosp.*	Gen	Church	125	58	14	305	4,203
St. Vincent's Hospital*	Gen	Church	125	58	14	305	4,203
Spencer, 5,019—Clay	Gen	City	26	13	8	148	865
Spencer Municipal Hospital	Gen	City	26	13	8	148	865
Spirit Lake, 1,778—Dickinson	Gen	Part	10	7	3	25	331
Spirit Lake Hospital	Gen	Part	10	7	3	25	331
Storm Lake, 4,157—Buena Vista	Gen	Indiv	9	6	5	71	246
Porath Hospital	Gen	Indiv	9	6	5	71	246
Toledo, 1,825—Tama	Gen	IA	92	52	3	14	167
Sac and Fox Sanatorium	Gen	IA	92	52	3	14	167
Vinton, 3,372—Benton	Gen	City	25	15	6	113	514
Virginia Gay Hospital	Gen	City	25	15	6	113	514
Washington, 4,814—Washington	Gen	County	35	19	10	184	961
Washington County Hosp.*	Gen	County	35	19	10	184	961
Waterloo, 46,191—Black Hawk	Gen	NPAasn	75	58	15	462	1,936
Allen Memorial Hospital	Gen	NPAasn	37	26	10	167	1,253
Presbyterian Hospital	Gen	Church	72	36	10	376	2,122
St. Francis Hospital*	Gen	Church	72	36	10	376	2,122
Waverly, 3,652—Bremer	Gen	Church	50	21	10	183	1,180
St. Joseph Mercy Hospital*	Gen	Church	50	21	10	183	1,180
West Union, 2,036—Fayette	Gen	City	11	7	3	34	247
West Union Community Hospital	Gen	City	11	7	3	34	247
Williamsburg, 1,219—Iowa	Gen	Indiv	9	2	2	21	131
Miller Hospital	Gen	Indiv	9	2	2	21	131
Related Institutions							
Ames, 10,261—Story	Inst	State	75	13	..	..	1,934
Iowa State College Hosp.*	Inst	State	75	13	..	..	1,934
Anamosa, 3,579—Jones	Inst	State	115	94	..	..	477
Men's Reformatory Hosp.*	Inst	State	115	94	..	..	477
Belmond, 1,733—Wright	Gen	Part	11	6	5	28	291
Belmond Hospital	Gen	Part	11	6	5	28	291
Bettendorf, 2,768—Scott	Conv	Frat	55	44	..	..	12
Masonic Sanitarium	Conv	Frat	55	44	..	..	12
Burlington, 26,755—Des Moines	Ment	County	70	70	..	..	9
Des Moines County Asylum	Ment	County	70	70	..	..	9
Council Bluffs, 42,048—Portawattamie	Inst	NPAasn	34	7	..	..	302
Christian Home Hospital	Inst	NPAasn	34	7	..	..	302
Iowa School for the Deaf	Inst	State	54	7	..	..	740
Infirmiry	Inst	State	54	7	..	..	740
Davenport, 60,751—Scott	Inst	State	57	38	..	..	1,325
Iowa Soldiers' Orphans' Home Hospital	Inst	State	57	38	..	..	1,325
Des Moines, 142,559—Polk	Mat	NPAasn	20	22	15	21	26
Benedict Home	Mat	NPAasn	20	22	15	21	26
Junior League Convalescent Home for Children	Conv	NPAasn	20	18	..	..	100
Salvation Army Booth Memorial Hospital	Mat	Church	50	31	30	112	117
Eldora, 3,200—Hardin	Inst	State	20	12	..	..	1,825
Iowa Training School for Boys Hospital	Inst	State	20	12	..	..	1,825
Fort Madison, 13,779—Lee	Inst	State	38	22	..	..	300
Iowa State Penitentiary Hospital	Inst	State	38	22	..	..	300
Glenwood, 4,269—Mills	State	McDe	1,801	1,802	..	..	104
Glenwood State School	State	McDe	1,801	1,802	..	..	104
Harlan, 3,145—Shelby	Gen	Indiv	14	9	5	74	408
Harlan Hospital	Gen	Indiv	14	9	5	74	408
Manchester, 3,413—Delaware	Gen	Indiv	10	6	2	50	275
Dr. Jones Hospital	Gen	Indiv	10	6	2	50	275
Marshalltown, 17,373—Marshall	Inst	State	180	120	..	..	333
Iowa Soldiers' Home Hosp.*	Inst	State	180	120	..	..	333
Odebolt, 1,388—Sac	Gen	Indiv	9	2	3	10	76
Odebolt Hospital	Gen	Indiv	9	2	3	10	76
Orange City, 1,727—Sioux	Gen	Indiv	6	2	1	8	154
Doornink Hospital	Gen	Indiv	6	2	1	8	154
Postville, 1,009—Allamakee	Gen	Corp	13	8	4	62	252
Postville Community Hosp. Gen	Gen	Corp	13	8	4	62	252
Red Oak, 5,778—Montgomery	Part	McDe	52	50	..	..	9
Powell School for Backward and Nervous Children	Part	McDe	52	50	..	..	9
Sac City, 2,854—Sac	Gen	Indiv	10	2	3	14	93
Sac City Hospital	Gen	Indiv	10	2	3	14	93
Sioux City, 79,183—Woodbury	Mat	NPAasn	50	22	25	43	71
Florence Crittenton Home	Mat	NPAasn	50	22	25	43	71
Toledo, 1,825—Tama	Inst	State	23	10	..	..	237
State Juvenile Home Hosp.*	Inst	State	23	10	..	..	237
Waukon, 2,526—Allamakee	Mat	Indiv	5	1	4	45	47
Hall Hospital	Mat	Indiv	5	1	4	45	47
Rominger and Jeffries Emergency Hospital	Gen	Part	8	2	..	..	134
Winterset, 2,921—Madison	Gen	Indiv	14	8	5	57	451
Winterset Hospital	Gen	Indiv	14	8	5	57	451
Woodward, 901—Dallas	State	McDe	1,462	1,410	..	..	109
Hospital for Epileptics and School for Feeble-minded	State	McDe	1,462	1,410	..	..	109

KANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Abilene, 5,638—Dickinson	Gen	NPAasn	30	13	7	103	716
Dickinson County Memorial Hospital	Gen	NPAasn	30	13	7	103	716
Anthony, 2,947—Harper	Gen	Indiv	11	6	2	31	370
Community Hospital	Gen	Indiv	32	31	7	119	1,163
Galloway Hospital	Gen	Indiv	32	31	7	119	1,163
Arkansas City, 13,946—Cowley	Gen	NPAasn	25	12	12	175	622
Mersey Hospital	Gen	NPAasn	28	4	5	3	161
Stricklen Hospital	Gen	NPAasn	28	4	5	3	161
Atchison, 13,024—Atchison	Gen	NPAasn	34	27	8	290	717
Atchison Hospital	Gen	NPAasn	34	27	8	290	717
Axtell, 604—Marshall	Gen	Indiv	12	6	5	46	364
Axtell Hospital	Gen	Indiv	12	6	5	46	364
Belleville, 2,383—Republic	Gen	Church	20	7	4	26	223
R. G. Patterson Memorial Hospital	Gen	Church	20	7	4	26	223
Beloit, 3,502—Mitchell	Gen	NPAasn	49	15	6	138	690
Community Hospital*	Gen	NPAasn	49	15	6	138	690
Chanute, 10,277—Neosho	Gen	Corp	56	25	6	69	907
Johnson Hospital*	Gen	Corp	56	25	6	69	907
Coffeyville, 16,198—Montgomery	Gen	Indiv	10	5	4	3	150
Coffeyville General Hospital	Gen	Indiv	10	5	4	3	150
Medical Center Hospital	Gen	NPAasn	18	10	6	107	...
Southeast Kansas Hospital*	Gen	NPAasn	23	10	6	84	515
Columbus, 3,235—Cherokee	Gen	City	19	7	2	4	607
Maude Norton Memorial City Hospital	Gen	City	19	7	2	4	607
Concordia, 5,792—Cloud	Gen	Church	35	12	4	28	225
Concordia Hospital	Gen	Church	35	12	4	28	225
St. Joseph's Hospital*	Gen	Church	75	52	10	125	1,266
Dodge City, 10,059—Ford	Gen	Church	80	43	15	177	1,623
St. Anthony Hospital*	Gen	Church	80	43	15	177	1,623
Eldorado, 10,311—Butler	Gen	NPAasn	47	34	8	214	1,432
Susan B. Allen Memorial Hospital*	Gen	NPAasn	47	34	8	214	1,432
Elkhart, 1,435—Morton	Gen	Indiv	18	5	2	4	93
Tucker Hospital	Gen	Indiv	18	5	2	4	93
Ellsworth, 2,072—Ellsworth	Gen	Corp	37	22	7	101	802
Ellsworth Hospital*	Gen	Corp	37	22	7	101	802
Emporia, 14,067—Lyon	Gen	County	66	38	14	227	1,588
Newman Memorial County Hospital*	Gen	County	66	38	14	227	1,588
Fort	Gen	Church	95	31	10	93	1,022
Fort	Gen	Church	95	31	10	93	1,022
Fort Riley, 3,500—Geary	Gen	Army	182	108	10	40	2,130
Station Hospital*	Gen	Army	182	108	10	40	2,130
Fort Scott, 10,763—Bourbon	Gen	Church	110	76	12	256	2,785
Mersey Hospital*	Gen	Church	110	76	12	256	2,785
Garden City, 6,121—Finney	Gen	Church	43	28	7	152	1,252
St. Catherine's Hospital*	Gen	Church	43	28	7	152	1,252
Girard, 2,442—Crawford	Gen	City	14	6	4	40	265
Girard General Hospital	Gen	City	14	6	4	40	265
Goessel, 250—Marion	Gen	Church	16	10	6	50	263
Mennonite Bethesda Hosp.*	Gen	Church	16	10	6	50	263
Goodland, 3,262—Sherman	Gen	Church	21	10	4	63	461
Boothroy Memorial Hosp.*	Gen	Church	21	10	4	63	461
Great Bend, 5,548—Barton	Gen	Church	98	60	19	428	2,466
St. Rose Hospital*	Gen	Church	98	60	19	428	2,466
Halstead, 1,373—Harvey	Gen	Church	170	114	8	52	3,430
Halstead Hospital*	Gen	Church	170	114	8	52	3,430
Harper, 1,485—Harper	Gen	Indiv	10	5	4	43	221
Joslin Hospital	Gen	Indiv	10	5	4	43	221
Hays, 4,618—Ellis	Gen	Church	38	10	6	51	550
Hays Protestant Hospital	Gen	Church	38	10	6	51	550
St. Anthony's Hospital*	Gen	Church	100	84	22	280	2,330
Herington, 4,519—Dickinson	Gen	NPAasn	20	9	5	17	200
Mersey Hospital	Gen	NPAasn	20	9	5	17	200
Hillsboro, 1,647—Marion	Gen	Church	22	8	7	77	474
Salem Hospital	Gen	Church	22	8	7	77	474
Hoisington, 3,001—Barton	Gen	NPAasn	15	5	3	19	430
Hoisington Hospital	Gen	NPAasn	15	5	3	19	430
Horton, 4,049—Brown	Gen	Part	25	16	6	140	845
Horton Hospital	Gen	Part	25	16	6	140	845
Hutchinson, 27,085—Reno	Gen	Church	125	49	18	452	2,251
Grace Hospital*	Gen	Church	60	36	12	318	1,516
St. Elizabeth Mercy Hosp.*	Gen	Church	60	36	12	318	1,516
Independence, 12,782—Montgomery	Gen	Church	56	34	10	140	936
Mersey Hospital*	Gen	Church	56	34	10	140	936
Iola, 7,160—Allen	Gen	Church	25	15	8	110	632
St. John's Hospital	Gen	Church	25	15	8	110	632
Junction City, 7,407—Geary	Gen	City	40	16	9	109	640
Junction City Municipal Hospital	Gen	City	40	16	9	109	640
Kansas C of University of Kansas Hospitals							
Bell Me	Gen	Church	130	92	22	368	2,024
Bethany Hospital*	Gen	Church	25	8	3	33	217
Douglass Hospital	Gen	Indiv	37	14	..	..	201
Grandview Sanitarium	Gen	Indiv	37	14	..	..	201
Providence Hospital*	Gen	Church	85	84	20	267	3,074
St. Margaret's Hospital*	Gen	Church	221	158	26	352	4,380
University of Kansas Hospitals*	Gen	State	325	231	25	430	5,862
Larned, 3,532—Pawnee	Gen	NPAasn	15	6	3	88	473
Larned City Hospital	Gen	NPAasn	15	6	3	88	473
Larned State Hospital	Ment	State	1,382	1,169	..	..	211
Lawrence, 13,727—Douglas	Gen	City	65	22	10	257	1,317
Lawrence Memorial Hosp.*	Gen	City	65	22	10	257	1,317
Leavenworth, 17,466—Leavenworth	Gen	NPAasn	55	23	10	165	1,096
Cushing Memorial Hosp.*	Gen	NPAasn	55	23	10	165	1,096
St. John's Hospital*	Gen	Church	65	59	10	159	899

Key to symbols and abbreviations is on page 1195

KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Liberal, 5,294—Seward							
Epworth Hospital	Gen	Church	42	12	9	59	353
Lyons, 2,939—Rice							
Lyons Hospital	Gen	NPAasn	20	11	6	163	592
Manhattan, 10,136—Riley							
St. Mary Hospital ¹⁰	Gen	Church	50	30	11	168	1,734
Marysville, 4,013—Marshall							
Marysville Hospital	Gen	Indiv	10	2	4	22	103
Randell Hospital	Gen	Indiv	12	7	3	37	253
Mulvane, 1,042—Sumner							
Atchison, Topeka and Santa Fe Railway Hospital ¹⁰	Indus	NPAasn	50	31	..	..	326
Neodesha, 3,351—Wilson							
Wilson County Hospital	Gen	County	36	14	6	75	605
Newton, 11,034—Hurvey							
Axtell Christian Hospital ¹⁰	Gen	Church	65	35	12	172	1,289
Bethel Deaconess Hospital ¹⁰	Gen	Church	63	31	12	168	1,504
Norton, 2,767—Norton							
Kenney Memorial Hospital	Unit of State Sanatorium for Tuberculosis						
Norton Hospital	Gen	City	25	14	6	38	385
State Sanatorium for Tuberculosis ¹⁰	TB	State	510	308	..	..	278
Oberlin, 1,629—Decatur							
Benton Memorial Hospital	Gen	Indiv	14	5	3	23	213
Osawatomie, 4,440—Miami							
Osawatomie State Hospital ¹⁰	Ment	State	1,675 ¹	1,667	..	..	394
Ottawa, 9,563—Franklin							
Ransom Memorial Hospital	Gen	County	35	12	11	93	599
Parsons, 14,903—Lafayette							
Mercy Hospital	Gen	Church	35	21	10	137	780
Missouri, Kansas, Texas Railroad Employees' Hospital	Indus	NPAasn	50	25	..	..	496
State Hospital for Epileptics	Epil	State	959 ¹	871	..	..	85
Pittsburg, 18,145—Crawford							
Mt. Carmel Hospital ¹⁰	Gen	Church	75	40	5	180	1,573
Pratt, 6,322—Pratt							
Ninnescah Hospital ¹⁰	Gen	Corp	20	14	5	52	490
Snubetha, 2,332—Nemaha							
St. Anthony Murdock Memorial Hospital ¹⁰	Gen	Church	100	28	12	57	1,023
Salina, 20,155—Saline							
Asbury Protestant Hosp. ¹⁰	Gen	Church	50	40	15	222	1,435
St. John's Hospital ¹⁰	Gen	Church	58	47	15	225	1,260
Spearville, 703—Ford							
Perkins Hospital	Gen	NPAasn	10	6	3	26	352
Stafford, 1,614—Stafford							
Feldhut Memorial Hospital	Gen	Part	25	11	5	98	334
Sterling, 1,868—Rice							
Sterling Hospital	Gen	NPAasn	20	11	4	43	623
Syracuse, 1,353—Hamilton							
Donohue Memorial Hospital	Gen	County	23	6	4	48	199
Topeka, 64,120—Shawnee							
Atchison, Topeka and Santa Fe Railway Hospital ¹⁰	Indus	NPAasn	140	81	..	..	2,014
Christ's Hospital ¹⁰	Gen	Church	91	55	20	228	2,097
Hillcrest Sanatorium	TB	CyCo	70	50	..	..	157
Jane C. Stormont Hosp. ¹⁰	Gen	NPAasn	80	60	20	343	2,011
Menninger Sanitarium ¹⁰	N&M	Corp	60	46	..	..	109
St. Francis Hospital ¹⁰	Gen	Church	100	57	15	294	1,729
Topeka State Hospital	Ment	State	1,889 ¹	1,909	..	..	374
Wadsworth, Leavenworth Veterans Admin. Facility ¹⁰	Gen	Vet	734	599	..	..	4,435
Wamego, 1,647—Pottawatomie							
Genn Hospital	Gen	City	20	12	6	60	560
Wellington, 7,405—Sumner							
Hatcher Hospital	Gen	NPAasn	30	8	6	55	565
St. Luke's Hospital	Gen	NPAasn	20	8	8	70	452
Wichita, 111,110—Sedgwick							
Coffman Hospital	Gen	Indiv	15	5	2	17	270
St. Francis Hospital ¹⁰	Gen	Church	275	190	25	724	5,535
Sedgwick County Hospital	Gen	County	69	56	6	53	1,805
Veterans Admin. Facility ¹⁰	Vet		246	160	..	..	1,747
Wesley Hospital ¹⁰	Gen	Church	225	138	20	532	5,244
Wichita Hospital ¹⁰	Gen	Church	100	88	15	364	2,597
Winfield, 9,398—Cowley							
St. Mary's Hospital ¹⁰	Gen	Church	50	38	6	84	1,048
William Newton Memorial Hospital ¹⁰	Gen	City	47	35	10	176	1,118
Related Institutions							
Ashland, 1,232—Clark							
Ashland Hospital	Gen	NPAasn	11	3	4	55	263
Caldwell, 2,046—Sumner							
Caldwell General Hospital	Gen	NPAasn	20	7	5	36	290
Ellsworth, 2,072—Ellsworth							
Mother Bickerdyke Home and Hospital	Inst	State	32	23	..	..	62
Fort Dodge, 515—Ford							
Kansas State Soldiers' Home Hospital	Inst	State	26	14	..	2	592
Fort Leavenworth, 4,982—Leavenworth							
U. S. Penitentiary Annex Hospital ¹⁰	Inst	Fed	150	110	..	..	1,115
Lansing, 988—Leavenworth							
Kansas State Penitentiary Hospital	Inst	State	55	25	..	..	800
Lawrence, 13,726—Douglas							
Haskell Institute Hospital	Inst	IA	40	7	..	..	413
Watkins Memorial Hospital	Inst	State	62	18	..	..	1,465

KANSAS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Leavenworth, 17,466—Leavenworth							
U. S. Penitentiary Hospital ¹⁰ Inst	Fed		190	134	..	..	26
Little River, 618—Rice							
Hoffman Memorial Hospital Gen	City		20	3	2	35	12
Manhattan, 10,136—Riley							
Kansas State College Hosp. Inst	State		50	8	..	..	71
"	Gen	Indiv	9	3	..	10	17
Notwich, 411—Kugman							
Wallace Hospital	Gen	Indiv	9	4	2	16	51
St. Francis, 914—Cheyenne							
St. Francis Hospital	Gen	Indiv	12	4	1	11	10
Scott City, 1,544—Scott							
Scott City Hospital	Gen	NPAasn	11	5	4	47	53
Topeka, 64,120—Shawnee							
Florence Crittenton Home	Mat	NPAasn	20	12	12	30	5
State Industrial School for Boys	Inst	State	24	6	..	..	1
Wichita, 111,110—Sedgwick							
Salvation Army Home and Hospital	Mat	Church	73	39	19	55	8
Sedgwick County Tuberculosis Sanitarium	TB	County	60	45	..	..	6
Suburban Rest Sanitarium	Conv	Indiv	30	10	..	..	19
Winfield, 9,398—Cowley							
State Training School	MeDe	State	1,317 ¹	1,239	..	..	31

KENTUCKY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Anchorage, 564—Jefferson							
Hord's Sanitarium	N&M	Indiv	55	37	..	..	9
Ashland, 29,074—Boyd							
Kings Daughters Hospital	Gen	NPAasn	100	85	14	303	1,773
Berea, 1,827—Madison							
Berea College Hospital ¹⁰	GenIso	NPAasn	125	32	5	41	2,623
Beverly, 69—Bell							
Red Bird Evangelical Hosp. Gen	Church		9	4	4	34	18
Bowling Green, 12,348—Warren							
City Hospital	Gen	City	45	18	8	107	77
Campbellsville, 1,923—Taylor							
Campbellsville Hospital	Gen	NPAasn	8	3	2	13	10
Corbin, 8,036—Whitley							
Smith Hospital	Gen	Indiv	28	10	1	10	54
Covington, 65,252—Kenton							
St. Elizabeth Hospital ¹⁰	Gen	Church	286	225	30	568	5,721
Wm. Booth Memorial Hosp. Gen	Church		85	55	18	322	1,667
Cynthiana, 4,886—Harrison							
Harrison Memorial Hospital Gen	NPAasn		35	17	8	64	210
Danville, 6,729—Boyle							
Danville and Boyle County Hospital	Gen	NPAasn	61	34	9	98	1,624
Dayton, 9,071—Campbell							
Speer's Memorial Hospital ¹⁰	Gen	County	110	62	15	282	2,555
Fort Knox, 600—Hardin							
Station Hospital	Gen	Army	127	90	5	60	2,184
Fort Thomas, 10,008—Campbell							
Station Hospital	Gen	Army	142	68	2	15	1,422
Frankfort, 11,626—Franklin							
Kings Daughters Hospital	Gen	NPAasn	75	30	17	170	1,267
Georgetown, 4,229—Scott							
John Graves Ford Memorial Hospital	Gen	CyCo	24	16	6	46	42
Gilbertsville, 329—Marshall							
Kentucky Dam Hospital	Gen	Fed	21	..	6	Estab. 1911	
Glasgow, 5,042—Barren							
T. J. Sampson Community Hospital ¹⁰	Gen	NPAasn	51	45	9	76	2,251
Greenville, 2,451—Muhlenberg							
Muhlenberg Community Hospital	Gen	NPAasn	30	15	5	20	96
Harlan, 4,327—Harlan							
Harlan Hospital	Gen	Corp	70	47	5	71	1,255
Harrodsburg, 4,023—Mercer							
A. D. Price Memorial Hosp. Gen	NPAasn		20	9	4	20	48
Hazard, 7,021—Perry							
Hazard Hospital	Gen	Corp	78	34	8	61	1,507
Hurst-Snyder Hospital	Gen	Corp	25	9	5	13	74
Henderson, 11,668—Henderson							
Henderson Hospital	Gen	NPAasn	48	25	8	98	1,400
Hopkinsville, 10,746—Christian							
Jennie Stuart Memorial Hospital	Gen	NPAasn	32	18	1	54	291
Hyden, 1,471—Leslie							
Frontier Nursing Service Hospital	Gen	NPAasn	17	10	6	63	377
Jackson, 2,160—Brenthitt							
Bach Memorial Hospital	Gen	Indiv	15	3	2	4	1,777
Jenkins, 5,465—Letcher							
Jenkins Hospital ¹⁰	Gen	NPAasn	65	29	6	26	1,200
Lebanon, 2,248—Marion							
Baile Infirmary	Gen	Indiv	15	9	4	22	67
Lexington, 45,700—Fayette							
Good Samaritan Hosp. ¹⁰	Gen	Church	20	14	15	17	675
High Oaks Sanatorium	N&M	Indiv	25	18	..	..	10

Key to symbols and abbreviations is on page 1195

KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Julius Marks Sanatorium.. TB	County	Church	103	92	..	142	..
St. Joseph Hospital**AO.. Gen	..	..	228	133	22	436	7,429
Shriners Hospital for Crip- pled Children..	Orth	Frat	24	21	..	..	88
U. S. Public Health Service Hospital*	Drug	Fed	1,000	999	..	..	1,013
Veterans Admin. Facility.. Ment	Vet	..	559	549	..	..	715
London, 1,950—Laurel	..	..	..	..	..	..	..
Pennington General Hosp... Gen	Corp	..	30	11	2	8	345
Louisia, 1,961—Lawrence	..	..	..	..	..	..	..
Louisia General Hospital... Gen	Indiv	..	21	4	6	13	165
Riverview Hospital .. Gen	Indiv	..	10	6	3	39	194
Louisville, 307,745—Jefferson	..	..	..	..	..	..	..
Bel Air Sanatorium..... N&M	Indiv	..	15	..	..	Estab. 1939	..
Children's Free Hospital*AO. Chrl	NPAssn	..	75	..	..	60	1,153
Jewish Hospital*AO .. Gen	NPAssn	..	86	50	14	185	1,593
Kentucky Baptist Hosp.*AO Gen	Church	..	150	120	20	443	4,523
Kosair Crippled Children Hospital*	Orth	NPAssn	100	77	..	..	687
Louisville City Hospital**AO Gen	City	..	527	404	60	1,211	12,013
Louisville Neuropathic Sana- torium .. N&M	Corp	..	24	24	..	..	283
Methodist Deaconess Hosp.*AO Gen	Church	..	67	55	8	226	1,971
Norton Memorial Infirm.*AO Gen	NPAssn	..	140	87	25	344	3,379
Pope Sanatorium .. N&M	Corp	..	17	6	..	..	90
Red Cross Hospital .. Gen	NPAssn	..	60	28	6	12	328
St. Anthony's Hospital*AO. Gen	Church	..	138	117	25	514	3,208
St. Joseph Infirmary**AO.. Gen	Church	..	275	183	28	435	6,849
SS. Mary and Elizabeth Hos- pital*AO .. Gen	Church	..	145	97	30	825	4,528
State Tuberculosis Sanat... TB	State	..	130	107	..	..	238
Stokes Hospital .. N&M	Indiv	..	40	15	..	..	110
U. S. Marine Hospital*AO.. Gen	USPHS	..	164	90	..	..	1,500
Lynch, 7,000—Earlan	..	..	..	..	..	..	..
Lynch Hospital .. Gen	NPAssn	..	50	19	4	96	959
Madisonville, 6,908—Hopkins	..	..	..	..	..	..	..
Hopkins County Hospital... Gen	NPAssn	..	65	10	6	50	850
Mayfield, 8,177—Graves	..	..	..	..	..	..	..
Fuller-Gilliam Hospital .. Gen	Corp	..	25	12	4	66	693
Mayfield Hospital .. Gen	NPAssn	..	40	14	4	76	686
Maysville, 6,557—Masoa	..	..	..	..	..	..	..
Haywood Hospital .. Gen	NPAssn	..	53	29	8	94	1,135
Middlesboro, 10,350—Bell	..	..	..	..	..	..	..
Middlesboro Hospital .. Gen	Corp	..	50	32	8	65	2,115
Murray, 2,891—Calloway	..	..	..	..	..	..	..
Keys-Houston Clinic Hosp.. Gen	Part	..	27	10	8	39	350
Wm. Mason Memorial Hos- pital*AO .. Gen	NPAssn	..	150	24	6	56	1,018
Outwood, —Christian	..	..	..	..	..	..	..
Veterans Admin. Facility*.. TB	Vet	..	375	353	..	..	1,222
Owensboro, 22,765—Davies	..	..	..	..	..	..	..
Owensboro-Davies County Hospital*AO .. Gen	CyCo	..	65	55	12	303	2,720
Paducah, 33,541—McCracken	..	..	..	..	..	..	..
Ewart Purell Isolation Hos- pital .. Unit of Riverside Hospital	Indus	NPAssn	95	31	..	..	1,830
Illinois Central Hospital*AO.. Gen	City	..	81	32	12	240	1,548
Paintsville, 2,411—Johnson	..	..	..	..	..	..	..
Paintsville Hospital .. Gen	Corp	..	60	34	6	67	1,334
Paris, 6,204—Bourbon	..	..	..	..	..	..	..
W. W. Massie Memorial Hos- pital*AO .. Gen	City	..	50	28	5	123	818
Pewee Valley, 582—Oldham	..	..	..	..	..	..	..
Pewee Valley Sanitarium and Hospital .. Gen	NPAssn	..	35	28	3	31	332
Pikeville, 3,376—Pike	..	..	..	..	..	..	..
Methodist Hospital .. Gen	Church	..	100	40	8	60	1,660
Pineville, 3,567—Bell	..	..	..	..	..	..	..
Pineville Community Hosp.. Gen	Corp	..	37	20	4	35	895
Richmond, 6,495—Madison	..	..	..	..	..	..	..
Gilson Hospital .. Gen	Indiv	..	15	8	3	12	240
Irvine-McDowell Memorial Hospital for Treatment of Trachoma .. Trach	State	..	38	21	..	..	248
Pattie A. Clay Infirmary... Gen	NPAssn	..	51	39	4	72	1,100
Russellville, 3,297—Logan	..	..	..	..	..	..	..
Russellville Hospital .. Gen	Corp	..	15	7	3	24	363
Somerset, 5,506—Pulaski	..	..	..	..	..	..	..
Somerset General Hospital.. Gen	Corp	..	20	10	2	42	977
Versailles, 2,244—Woodford	..	..	..	..	..	..	..
Woodford Memorial Hosp.. Gen	CyCo	..	34	12	4	76	460
Waverly Hills—Jefferson	..	..	..	..	..	..	..
Waverly Hills—Jefferson Hospital*AO .. TB	CyCo	..	320	489	..	..	288
V .. Gen	NPAssn	..	40	16	6	60	622
V .. Gen	NPAssn	..	20	15	3	5	267
Related Institutions							
Barbourville, 2,280—Knox	..	..	..	..	..	..	..
Logan Hospital .. Gen	Corp	..	17	4	1	24	247
Covington, 6,522—Kenton	..	..	..	..	..	..	..
Covington-Kenton County Tuberculosis Sanatorium.. TB	County	..	17	15	..	..	28
Fleming, 1,289—Letcher	..	..	..	..	..	..	..
Fleming Hospital .. Indus	NPAssn	..	23	3	..	6	163
Frankfort, 11,626—Franklin	..	..	..	..	..	..	..
State Institution for the Feeble-minded .. MeDe	State	..	795	750	..	..	31

KENTUCKY—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Fulton, 3,502—Fulton	..	..	..	..	..	..	..
Fulton Hospital .. Gen	Part	..	9	4	2	61	182
Grayson, 1,022—Carter	..	..	..	..	..	..	..
J. Q. Stovall Memorial Hosp. Gen	Corp	..	20	8	3	30	322
Hopkinsville, 10,746—Christian	..	..	..	..	..	..	..
Western State Hospital.... Ment	State	..	1,920	1,072	..	..	566
La Grange, 1,121—Oldham	..	..	..	..	..	..	..
State Reformatory Hosp... Inst	State	..	65	41	..	..	1,291
Lakeland, 55—Jefferson	..	..	..	..	..	..	..
Central State Hospital.... Ment	State	..	2,400	2,382	..	..	588
Lexington, 45,736—Fayette	..	..	..	..	..	..	..
Eastern State Hospital.... Ment	State	..	2,039	1,910	..	..	731
Louisville, 307,745—Jefferson	..	..	..	..	..	..	..
Kings Daughters Home for Incurables .. Incur	NPAssn	..	96	92	..	..	25
Susan Speed Davis Home and Hospital .. MatCh	Church	..	43	35	19	83	107
Princeton, 4,764—Caldwell	..	..	..	..	..	..	..
Princeton Hospital .. Gen	NPAssn	..	15	5	3	23	320

LOUISIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Abbeville, 4,356—Vermilion	..	..	..	..	..	..	..
Abbeville Clinic .. Gen	Part	..	12	6	4	120	543
Alexandria, 23,025—Rapides	..	..	..	..	..	..	..
Baptist Hospital*AO .. Gen	Church	..	88	37	10	249	2,244
Veterans Admin. Facility*.. Gen	Vet	..	621	525	..	..	3,652
Barksdale Field, —Bossier	..	..	..	..	..	..	..
Station Hospital*AO .. Gen	Army	..	136	102	5	53	1,999
Bastrop, 5,121—Morehouse	..	..	..	..	..	..	..
Bastrop General Hospital... Gen	Indiv	..	19	6	4	42	457
Baton Rouge, 30,729—East Baton Rouge	..	..	..	..	..	..	..
Baton Rouge General Hosp.*AO Gen	NPAssn	..	69	39	10	276	2,244
Our Lady of the Lake Sani- tarium*AO .. Gen	Church	..	125	95	18	720	4,916
Bogalusa, 14,029—Washington	..	..	..	..	..	..	..
Elizabeth Sullivan Memorial Hospital*AO .. Gen	Corp	..	84	62	12	231	2,684
Carville, 308—Iberville	..	..	..	..	..	..	..
U. S. Marine Hospital*AO.. Lepro	USPHS	..	454	356	..	..	74
Converse, 291—Sabine	..	..	..	..	..	..	..
Allen Sanitarium .. Gen	Indiv	..	26	9	8	80	700
Covington, 3,208—St. Tammany	..	..	..	..	..	..	..
New Fenwick Sanitarium... N&M	Indiv	..	64	17	..	..	184
Crowley, 7,656—Acadia	..	..	..	..	..	..	..
Crowley Sanitarium (Legion Memorial Hospital) .. Gen	NPAssn	..	20	7	3	52	653
Dell .. Part	..	..	12	2	4	34	187
De I .. Indiv	..	..	20	12	2	56	402
Ferriday, 2,502—Concordia	..	..	..	..	..	..	..
Ferriday Hospital .. Gen	Part	..	28	14	4	55	686
Greenwell Springs, 130—East Baton Rouge	..	..	..	..	..	..	..
Greenwell Springs Sanat... TB	State	..	113	101	..	..	79
Haynesville, 2,541—Claiborne	..	..	..	..	..	..	..
Haynesville Hospital*AO .. Gen	NPAssn	..	25	7	3	38	428
Houma, 6,531—Terrebonne	..	..	..	..	..	..	..
Ellender Memorial Hospital Gen	Part	..	20	10	4	110	694
Independence, 1,700—Tangipahoa	..	..	..	..	..	..	..
Florida Parishes Charity Hospital .. Gen	State	..	66	..	6	Estab. 1939	..
Jackson, 3,966—East Feliciana	..	..	..	..	..	..	..
East Louisiana State Hosp. Ment	State	..	4,100	3,495	..	..	856
Parker Hospital*AO .. Unit of East Louisiana State Hospital	..	..	..	..	..	..	..
Lafayette, 14,635—Lafayette	..	..	..	..	..	..	..
Lafayette Charity Hospital. Gen	State	..	216	237	20	257	7,593
Lafayette Sanitarium .. Gen	Corp	..	23	7	4	61	514
Lake Charles, 15,791—Calcasieu	..	..	..	..	..	..	..
St. Patrick's Hospital*AO .. Gen	Church	..	75	40	10	277	2,162
Lecompte, 1,247—Rapides	..	..	..	..	..	..	..
Lecompte Sanitarium .. Gen	Indiv	..	28	5	2	90	487
Madisonville, 3,567—Madison	..	..	..	..	..	..	..
Madisonville Hospital .. Gen	Corp	..	32	7	2	21	433
Madisonville Community Hosp.. Gen	Indiv	..	11	8	3	35	337
Minden, 6,623—Webster	..	..	..	..	..	..	..
Minden Sanitarium .. Gen	Corp	..	27	12	4	124	958
Monroe, 26,028—Ouachita	..	..	..	..	..	..	..
G. B. Cooley Sanatorium... TB	NPAssn	..	49	..	..	Estab. 1939	..
Riverside Sanitarium*AO .. Gen	Indiv	..	25	8	4	38	484
St. Francis' Sanitarium*AO.. Gen	Church	..	140	64	15	288	2,637
Vaughan-Wright-Bendel Clinic .. Gen	Part	..	25	15	6	68	931
New Iberia, 8,005—Iberia	..	..	..	..	..	..	..
Dauterive Hospital .. Gen	Indiv	..	30	10	5	176	949
Iberia General Hospital... Gen	Indiv	..	25	4	2	76	396
New Orleans, 458,762—Orleans	..	..	..	..	..	..	..
Charity Hospital**AO .. Gen	State	..	2,000	2,945	68	4,633	61,856
City Hospital for Mental Diseases .. Ment	City	..	100	52	..	..	629
Delgado Memorial Hospital. Unit of Charity Hospital	..	..	..	..	..	..	..
De Paul Sanitarium .. N&M	Church	..	330	275	..	..	405

Key to symbols and abbreviations is on page 1195

LOUISIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Eye, Ear, Nose and Throat Hospital* ^{1A}	ENT	NPAasn	78	36	..	...	3,022
Flint Goodridge Hospital of Dillard University* ^{2A}	Gen	NPAasn	88	38	12	249	1,387
French Hospital* ^{3A}	Gen	Frat	63	27	12	140	1,343
Hotel Dieu Sisters' Hospital* ^{4A0}	Gen	Church	240	216	29	713	10,145
Illinois Central Hospital* ^{5A}	Indus	NPAasn	60	24	..	...	837
John Dibert Memorial Tuberculosis Hospital	Unit of Charity Hospital						
Mercy Hospital—Soniat Memorial* ^{6A0}	Gen	Church	125	85	25	544	3,358
New Orleans Hospital and Dispensary for Women and Children	Gen	NPAasn	33	24	12	455	949
Richard Milliken Memorial Hospital	Unit of Charity Hospital						
Southern Baptist Hosp.* ^{7A0}	Gen	Church	248	178	27	762	11,568
Touro Infirmary* ^{8A0}	Gen	NPAasn	400	300	40	1,130	11,911
U. S. Marine Hospital* ^{9A}	Gen	USPHS	573	411	..	...	4,319
Opelousas, 6,299—St. Landry St. Rita's Infirmary	Gen	Part	40	20	..	20	420
Pineville, 3,612—Rapides Central Louisiana State Hospital	Ment	State	2,200 ¹	2,150	..	...	625
Fuqua Memorial Hospital* ^{10A}	Unit of Central Louisiana State Hospital						
Huey P. Long Charity Hosp. Gen	State	375	...	32	Estab. 1939	...	1939
Plaquemine, 5,124—Iberville Plaquemine Sanitarium	Gen	NPAasn	25	8	6	153	846
Port Sulphur, 25—Plaquemine Port Sulphur Hospital	Gen	NPAasn	12	6	4	26	273
Ruston, 4,400—Lincoln Ruston-Lincoln Sanitarium. Gen	Corp	25	9	6	85	720	
Shreveport, 76,653—Caddo Gilmer Chest Hospital	TB	Indiv	18	...	..	Estab. 1939	...
Gowen Sanatorium	TB	NPAasn	24	19	...	...	56
Highland Sanitarium* ^{11A0}	Gen	Corp	100	68	18	292	3,374
North Louisiana Sanit.* ^{12A0}	Gen	Corp	100	70	10	229	2,610
Plains Sanatorium	TB	NPAasn	104	77	..	...	135
T. E. Schumpert Memorial Sanitarium* ^{13A0}	Gen	Church	136	75	12	238	3,284
Shreveport Charity Hosp.* ^{14A0} Gen	State	800	776	75	2,444	28,455	
Shriners Hospital for Crippled Children* ^{15A}	Orth	Frat	60	60	..	...	194
Tri-State Hospital* ^{16A0}	Gen	Corp	100	72	10	333	3,852
Tallulah, 3,322—Madison Tallulah Hospital and Clinic Gen	Indiv	15	8	3	25	310	
Thibodaux, 4,442—La Fourche St. Joseph Hospital	Gen	Church	40	13	4	83	1,176
Winnsboro, 1,965—Franklin Rogers Clinic and Hospital. Gen	Indiv	12	5	2	45	423	

Related Institutions

Alexandria, 23,025—Rapides State Colony and Training School.....	MeDe	State	857 ¹	800	..	...	26
Angola, 18—West Feliciana Louisiana State Penitentiary Hospital.....	Inst	State	21	...No data supplied			
Breaux Bridge, 1,390—St. Martin St. Paul Hospital.....	Gen	Indiv	10	2	1	2	107
Elizabeth, 3,000—Allen Industrial Lumber Company Hospital.....	Indus	NPAasn	22	...No data supplied			
Hodge, 1,367—Jackson Hodge Clinic.....	Gen	Indiv	8	4	2	56	320
New Orleans, 453,762—Orleans New Orleans Convalescent Home.....	Conv	NPAasn	30	20	..	...	218
Orleans Tuberculosis Hosp.. TB	NPAasn	100	55	..	...	...	121
Opelousas, 6,299—St. Landry St. Landry Clinic.....	Gen	NPAasn	45	25	4	90	900
Winnsboro, 1,965—Franklin Winnsboro Sanitarium.....	Gen	Corp	30	6	3	16	703

MAINE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Bednights	Number of Births	Admissions †
Augusta, 17,198—Kennebec							
Augusta General Hospital...	Gen	NPAasn	63	37	15	396	1,335
Augusta State Hospital....	Ment	State	1,637 ¹	1,521	..	...	295
.....	TB	NPAasn	20	19	..	...	24
.....	Ment	State	1,104 ¹	1,150	..	...	315
Eastern Maine General Hospitals* ¹	Gen	NPAasn	150	165	14	147	4,416
Paine Private Hospital....	Gen	Indiv	20	12	5	7	392
Bar Harbor, 4,486—Hancock							
Mount Desert Island Hosp..	Gen	NPAasn	58	23	19	69	531
Bath, 9,110—Sagadahoc							
Bath Memorial Hospital....	Gen	NPAasn	50	32	19	124	594
Belfast, 4,990—Waldo							
Bradbury Memorial Hosp... Gen	Gen	NPAasn	15	5	5	6	112

MAINE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Respirators	Number of Births	Admissions
Waldo County General Hospital ¹⁰	Gen	NPAasn	38	24	6	6	7
Biddeford, 17,633—York Trull Hospital ¹⁰	Gen	Corp	40	30	10	117	174
Webber Hospital ¹⁰	Gen	NPAasn	60	46	12	122	140
Blue Hill, 1,439—Hancock Blue Hill Memorial Hospital	Gen	NPAasn	25	12	8	35	24
Boothbay Harbor, 2,076—Lincoln St. Andrews Hospital.....	Gen	Corp	20	5	4	17	13
Brunswick, 6,144—Cumberland Brunswick Hospital.....	Gen	Indiv	46	20	6	35	54
Camden, 3,606—Knox Camden Community Hosp..	Gen	NPAasn	15	8	6	41	24
Cape Cottage, 50—Cumberland Station Hospital ¹⁰	Gen	Army	41	45	..	..	78
Caribou, 7,248—Aroostook Cary Memorial Hospital....	Gen	City	40	20	10	73	50
Castine, 726—Hancock Castine Community Hosp... Gen	Gen	NPAasn	12	8	6	71	40
Dover-Foxcroft, 3,750—Piscataquis Mayo Memorial Hospital... Gen	Gen	City	16	8	3	23	23
Eastport, 3,466—Washington Quoddy Hospital.....	Gen	Fed	20	4	..	4	29
Fairfield, 3,529—Somerset Central Maine Sanatorium ¹⁰ .. TB	TB	State	207	209	..	..	12
Farmington, 1,737—Franklin Franklin County Memorial Hospital ¹⁰	Gen	NPAasn	49	22	9	100	57
Fort Fairfield, 2,616—Aroostook Fort Fairfield Clinic.....	Gen	Corp	16	9	6	57	46
Gardiner, 5,609—Kennebec Gardiner General Hospital..	Gen	NPAasn	48	22	12	245	93
Greenville Junction, 345—Piscataquis Charles A. Dean Hospital... Gen	Gen	NPAasn	23	6	5	36	50
Greenwood Mountain, —Oxford Western Maine Sanat. ¹⁰	TB	State	150	142	..	..	70
Houlton, 6,865—Aroostook Aroostook General Hosp. ¹⁰ .. Gen	Gen	NPAasn	40	25	12	125	57
Madigan Memorial Hosp. ¹⁰ .. Gen	Gen	Church	40	20	7	79	1,311
Island Falls, 1,455—Aroostook Emma V. Milliken Memorial Hospital ¹⁰	Gen	NPAasn	15	8	5	68	26
L.....	..	..	..	..	..	..	..
.....pital ¹⁰	Gen	NPAasn	199	164	28	525	3,594
St. Mary's General Hosp. ¹⁰ Gen	Gen	Church	150	121	12	312	3,463
Mars Hill, 1,837—Aroostook Mars Hill Hospital.....	Gen	Indiv	8	2	3	5	7
Portland, 70,810—Cumberland Children's Hospital ¹⁰	Chil	NPAasn	100	70	..	...	572
Farrington Hospital.....	Gen	City	180	103	16	133	1,221
Dr. Leighton's Private Hosp. GynOb	GynOb	Indiv	14	10	12	71	49
Maine Eye and Ear Infirrm. ¹⁰ Gen	Gen	NPAasn	100	115	20	505	3,588
Maine General Hospital ¹⁰ .. Gen	Gen	NPAasn	254	216	27	655	6,218
Queen's Hospital.....	Gen	Church	48	41	12	93	1,172
State Street Hospital ¹⁰ Gen	Gen	Corp	50	44	12	110	1,112
U. S. Marine Hospital ¹⁰ Gen	Gen	USPHS	72	49	..	...	524
Presque Isle, 4,662—Aroostook Northern Maine Sanatorium TB	TB	State	125	115	..	...	13
Presque Isle General Hosp... Gen	Gen	NPAasn	50	29	10	126	1,112
Rockland, 9,075—Knox Knox County General Hosp. ¹⁰ Gen	Gen	NPAasn	70	29	7	61	89
Rumford, 10,340—Oxford Rumford Community Hospital ¹⁰	Gen	Corp	67	34	8	200	1,265
Sanford, 13,392—York Henrietta D. Goodall Hosp. Gen	Gen	NPAasn	52	29	8	80	94
Skowhegan, 6,432—Somerset Redington Memorial Hosp..	Gen	NPAasn	30	15	5	41	55
Togus, —Kennebec Veterans Admin. Facility ¹⁰ .. Gen	Gen	Vet	204	245	..	...	150
Waterville, 15,454—Kennebec Elm City Hospital.....	Gen	Indiv	35	24	6	73	657
Sisters Hospital ¹⁰	Gen	Church	87	52	17	155	3,491
Thayer Hospital ¹⁰	Gen	Corp	24	24	6	85	96
Westbrook, 10,897—Cumberland Westbrook Hospital.....	Gen	NPAasn	20	12	9	56	56

Related Institutions

Auburn, 18,571—Androscoggin								
Auburn Private Hospital.... Gen	Indiv	11	3	6	51	113		
Bangor, 25,749—Penobscot								
Friendship Hospital..... Gen	Indiv	12	7	4	29	25		
Gay Private Hospital..... N&M	Indiv	18	9	..	...	12		
Bar Mills, 500—York								
Buxton-Holts Hospital Gen	Indiv	12	4	2	19	10		
Eagle Lake, 1,750—Aroostook								
Northern Maine Gen. Hosp. Gen	Church	42	20	..	...	60		
East Parsonfield, 205—York								
Restland..... Conv	Corp	50	20	..	...	27		
Lubec, 2,224—Washington								
Lubec Hospital..... Gen	NPAasn	14	5	5	24	216		
Portland, 70,810—Cumberland								
Dr. C. P. Prescott Sanatorium "Shadow Lawn"..... Conv	Indiv	11	6	..	...	57		
Pownal, 462—Cumberland								
Pownal State School..... MeDe	State	1,120 ¹	1,070	..	...	75		
Union, 1,699—Knox								
Jones Sanitarium..... N&M	Corp	20	9	..	...	15		

Key to symbols and abbreviations is on page 1195

MARYLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Aberdeen Proving Ground, —Harford							
Station Hospital	Gen	Army	12	4	..	...	175
Annapolis, 12,531—Anne Arundel							
Annapolis Emergency Hosp.▲	Gen	NPAssn	85	55	15	281	1,774
U. S. Naval Hospital▲.....	Gen	Navy	224	59	..	...	1,879
Baltimore, 804,874—Baltimore City							
Baltimore City Hospitals*▲▲	Gen	City	1,255	1,073	60	2,168	8,831
Baltimore City Psychopathic Hospital.....		Unit of Baltimore City Hospitals					
Baltimore City Tuberculosis Hospital.....		Unit of Baltimore City Hospitals					
Baltimore Eye, Ear and Throat Charity Hosp.*▲	ENT	NPAssn	60	39	..	...	2,511
Beck Diagnostic Clinic.....	Gen	Indiv	12	9	..	...	193
Bon Secours Hospital*▲▲	Gen	Church	150	96	25	562	3,305
Children's Hospital School▲	Orth	NPAssn	144	93	..	...	308
Church Home and Infirmary*▲▲	Gen	Church	156	110	22	284	3,241
Franklin Square Hosp.*▲▲	Gen	NPAssn	207	95	25	505	3,470
Gundry Sanitarium	N&M	Indiv	45	41	..	...	38
Hospital for Women*▲▲	Gen	NPAssn	125	65	35	402	2,384
James Lawrence Kernan Hospital and Industrial School for Crippled Children▲							
.....	Orth	NPAssn	103	72	..	...	170
Johns Hopkins Hosp.*▲▲	Gen	NPAssn	873	775	72	1,504	17,453
Johnston Memorial Children's Hospital.....		Unit of Union Memorial Hospital					
Maryland General Hosp.*▲▲	Gen	Church	239	191	21	458	4,590
Mersey Hospital*▲▲	Gen	Church	293	275	32	546	9,045
Mount Hope Retreat.....	N&M	Church	600	588	..	...	123
Phipps Psychiatric Clinic.....	Unit of Johns Hopkins Hospital						
Presbyterian Eye, Ear and Throat Charity Hospital.....	ENT	Church	40	8	..	...	1,890
Provident Hospital and Free Dispensary*▲▲	Gen	NPAssn	129	87	9	150	1,896
St. Agnes' Hospital*▲▲	Gen	Church	218	129	28	369	3,856
St. Joseph's Hospital*▲▲	Gen	Church	248	187	33	754	5,813
Sinal Hospital*▲▲	Gen	NPAssn	243	200	40	696	5,861
South Baltimore General Hospital*▲▲	Gen	NPAssn	165	89	10	244	3,014
Sydenham Hospital*▲	Isa	City	110	52	..	...	1,218
Union Memorial Hosp.*▲▲	Gen	NPAssn	328	231	24	528	6,547
U. S. Marine Hospital*▲	Gen	USPHS	500	404	..	...	5,110
University Hospital*▲▲	Gen	State	400	348	50	1,171	9,281
Volunteers of America Hosp.	Gen	NPAssn	34	...	No data supplied		
West Baltimore General Hospital*▲▲	Gen	Corp	165	92	35	625	3,609
Brunswick, 3,671—Frederick							
Schnauffer Hospital	Gen	Indiv	30	13	5	31	403
Cambridge, 8,511—Dorchester							
Cambridge—Maryland Hospital▲	Gen	NPAssn	85	36	15	193	1,209
Eastern Shore State Hosp... Ment		State	540	454	..	...	193
Catonville, 7,617—Baltimore							
Harlem Lodge	N&M	Indiv	40	25	..	...	77
Spring Grove State Hosp.*. Ment		State	1,980	1,961	..	...	467
Chestertown, 2,809—Kent							
Kent and Upper Queen Anne's General Hospital	Gen	NPAssn	25	10	0	65	432
Crisfield, 3,850—Somerset							
Edward W. McCready Memorial Hospital	Gen	County	35	15	5	56	493
Crownsville, —Anne Arundel							
Crownsville State Hospital. Ment		State	1,496	1,339	..	...	455
Hospital for Colored Feeble-minded Children.....		Unit of Crownsville State Hospital					
Cumberland, 67,747—Allegany							
Allegany Hospital of the Sisters of Charity▲	Gen	Church	105	60	25	514	2,503
Memorial Hospital▲	Gen	CyCo	160	126	26	400	3,911
Easton, 4,092—Talbot							
Emergency Hospital▲	Gen	NPAssn	109	65	19	183	2,092
Edgewood, 300—Harford							
Station Hospital	Gen	Army	56	23	..	...	582
Elkton, 3,331—Cecil							
Union Hosp. of Cecil County	Gen	NPAssn	45	20	8	189	941
Fort George G. Meade, —Anne Arundel							
Station Hospital▲	Gen	Army	87	68	5	24	1,505
Fort Howard, 598—Baltimore							
Station Hospital	Gen	Army	41	19	1	3	487
Frederick, 11,331—Frederick							
Emergency Hospital	Gen	County	50	31	10	200	541
Frederick City Hospital▲	Gen	NPAssn	112	57	13	178	1,093
Frostburg, 5,558—Allegany							
Miners Hospital	Gen	State	39	21	10	131	733
Glenn Dale, 203—Prince Georges							
Glenn Dale Sanatorium.....	See Washington, D.C.						
Hagerstown, 20,861—Washington							
Washington County Hosp.▲	Gen	NPAssn	142	87	24	328	2,958
Ilwaco de Grace, 3,985—Harford							
Harford Memorial Hospital	Gen	NPAssn	42	...	No data supplied		
Heurton, 15—Carroll							
Maryland Tuberculosis Sanatorium	TB	State	392	266	..	...	292
Hampville, 72—Frederick							
Riggs Cottage Sanitarium.. N&M		Indiv	30	27	..	...	40
Laurel, 2,332—Prince Georges							
Laurel Sanitarium	N&M	Indiv	75	68	..	...	301

MARYLAND—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Mt. Wilson, 225—Baltimore							
Mt. Wilson Branch, Maryland Tuberculosis Sanat.. TB	State		183	184	..	...	152
Olney, 100—Montgomery							
Montgomery County General Hospital	Gen	NPAssn	40	37	14	151	1,237
Perry Point, 89—Cecil							
Veterans Admin. Facility▲. Ment	Vet		1,296	1,325	..	...	377
Prince Frederick, 200—Calvert							
Calvert County Hospital... Gen	NPAssn		23	12	5	97	515
Reisterstown, 1,635—Baltimore							
"Mt. Pleasant"	TB	NPAssn	60	56	..	...	51
Relay, 2,016—Baltimore							
Relay Sanitarium	N&M	Part	35	22	..	...	96
Rockville, 1,422—Montgomery							
Chestnut Lodge Sanitarium N&M	Indiv		45	33	..	...	93
Salisbury, 10,997—Wicomico							
Maryland Tuberculosis Sanatorium	TB	State	75	67	..	...	92
Peninsula General Hosp.▲. Gen	NPAssn		93	84	16	502	2,547
Silver Spring, 5,000—Montgomery							
Cedarcroft Sanatorium	N&M	Part	50	30	..	...	158
State Sanatorium, 200—Frederick							
Maryland Tuberculosis Sanatorium	TB	State	510	504	..	...	628
Sykesville, 661—Carroll							
Springfield State Hospital* Ment	State		2,547	2,789	..	...	620
Towson, 2,074—Baltimore							
Algburth Manor	Nerv	Indiv	23	19	..	...	78
Hospital for Consumptives (Endowment Sanatorium)...	TB	NPAssn	196	195	..	...	243
Sheppard and Enoch Pratt Hospital* Ment	N&M	NPAssn	285	285	..	...	365
Western Port, 3,440—Allegany							
Reeves Clinic	Gen	Part	16	8	4	57	420
Related Institutions							
Baltimore, 804,874—Baltimore City							
Baltimore City Jail Hosp.. Inst	City		24	9	..	...	450
Happy Hills Convalescent Home for Children.....	Conv	NPAssn	86	48	..	...	215
Home for Incurables.....	Incur	NPAssn	119	119	..	...	14
Maryland Penitentiary Hosp. Inst	State		50	22	..	...	291
Jessups, 161—Anne Arundel							
Maryland House of Correction Hospital	Inst	State	47	21	..	...	732
La Plata, 332—Charles							
Physicians Memorial Hosp.. Gen	County		25	...	..	Estab. 1939	
Laurel, 2,532—Prince Georges							
District Training School.....	See Washington, D.C.						
Leonardtown, 697—St. Marys							
St. Marys Hospital.....	Gen	NPAssn	32	9	6	71	353
Owings Mills, 130—Baltimore							
Rosewood State Training School	MeDe	State	1,300	1,185	..	...	78
Rockville, 1,422—Montgomery							
Christ Child Farm for Convalescent Children	Conv	NPAssn	32	34	..	...	100
Sparrows Point, —Baltimore							
Sparrows Point Hospital.... Indus	NPAssn		24	5	..	...	50

MASSACHUSETTS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Acushnet (New Bedford P.O.), 3,000—Bristol							
Acushnet Hospital	Gen	NPAssn	35	24	6	133	765
Adams, 12,697—Berkshire							
W. B. Plunkett Memorial Hospital▲	Gen	City	30	25	15	169	951
Aldenville (Chicopee Falls P.O.), —Hampden							
Chicopee Hospital	Gen	Indiv	35	15	6	39	196
Amesbury, 11,899—Essex							
Amesbury Hospital▲	Gen	City	30	16	6	113	1,198
Arlington, 36,094—Middlesex							
Ring Sanatorium and Hosp. N&M	Corp		60	40	..	...	253
Symmes Arlington Hosp.*. Gen	NPAssn		89	69	20	192	2,531
Attleboro, 21,769—Bristol							
Bristol County Tuberculosis Hospital	TB	County	60	65	..	...	80
Sturdy Memorial Hosp.▲. Gen	NPAssn		125	45	24	491	1,807
Ayer, 3,060—Middlesex							
Community Memorial Hospital▲	Gen	NPAssn	22	9	7	83	362
Bedford, 2,603—Middlesex							
Veterans Admin. Facility▲. Ment	Vet		1,166	1,106	..	...	133
Belmont, 21,742—Middlesex							
McLean Hospital*▲	N&M	NPAssn	232	213	..	...	299
Beverly, 25,656—Essex							
Beverly Hospital*▲	Gen	NPAssn	121	104	20	455	3,323
Boston, 781,155—Suffolk							
Adams House (Adams Nervine)	Nerv	NPAssn	24	17	..	...	69
Beth Israel Hospital*▲. Gen	NPAssn		230	189	..	...	6,199
Boston City Hospital*▲. Gen	City		2,296	1,521	117	2,214	42,993

Key to symbols and abbreviations is on page 1195

MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Boston Floating Hosp.*+⊙. Chil	NPAssn		50	35	..	1,019	
Boston Lying-in Hosp.*+⊙. Mat	NPAssn		144	112	144	2,552	3,189
Boston Psychopathic Hosp.*+⊙. Ment	State		110 ¹	85	..	2,114	
Boston State Hospital*+⊙. Ment	State		2,467 ¹	2,317	..	1,075	
Carney Hospital*+⊙. Gen	Church		186	163	24	487	4,716
Channing Home	TB	NPAssn	28	23	..	22	
Children's Hospital*+⊙. Chil	NPAssn		283	185	..	5,557	
Collis P. Huntington Memorial Hospital*+⊙. SkCa	NPAssn		25	14	..	501	
Emerson Hospital	Corp		30	...No data supplied			
Evangeline Booth Maternity Hospital and Home*+⊙. Mat	Church		75	82	65	460	708
Faulkner Hospital*+⊙. Gen	NPAssn		140	132	25	395	3,043
Glenside Hospital	N&M Corp		100	92	..	222	
Harley Private Hospital*+⊙. Gen	Corp		59	21	21	146	800
House of the Good Samaritan*+⊙. Card	NPAssn		80	77	..	172	
Infants' Hospital	Chil	NPAssn	45	35	..	755	
Jewish Memorial Hospital*+⊙. Gen	NPAssn		79	67	..	195	
Joseph H. Pratt Diagnostic Hospital*+⊙. IntMed	NPAssn		63	28	..	1,721	
Long Island Hospital*+⊙. Gen	City		625	554	4	35	1,294
Massachusetts Eye and Ear Infirmary*+⊙. ENT	NPAssn		231	145	..	7,376	
Massachusetts General Hospital*+⊙. Gen	NPAssn		452	368	..	7,220	
Massachusetts General Hospital, Baker Memorial*+⊙. Gen	NPAssn		243	208	46	573	5,732
Massachusetts General Hospital, Phillips House*+⊙. Gen	NPAssn		101	85	25	236	2,400
Massachusetts Memorial Hospitals*+⊙. Gen	NPAssn		392	232	45	676	7,572
Massachusetts Women's Hospital*+⊙. Gen	NPAssn		62	33	20	284	1,160
New England Baptist Hospital*+⊙. Gen	NPAssn		250	146	25	215	5,698
New England Deaconess Hospital*+⊙. Gen	Church		310	281	..	7,655	
New England Hospital for Women and Children*+⊙. Gen	NPAssn		185	127	75	1,475	5,445
Palmer Memorial Hospital*+⊙. Unit of New England Deaconess Hospital							
Peter Bent Brigham Hospital*+⊙. Gen	NPAssn		250	217	..	5,100	
Robert Breck Brigham Hospital*+⊙. Gen	NPAssn		115	81	..	830	
Robert Dawson Evans Memorial*+⊙. Unit of Massachusetts Memorial Hospitals							
St. .. Gen	Church		250	167	50	833	4,958
St. .. Gen	Church		60	39	34	557	1,432
St. Mary's Maternity Hosp. Sanatorium Division of Boston City Hospital*+⊙. TB	City		616	526	..	4	514
U. S. Marine Hospital*+⊙. Gen	USPHS		336	167	..	2,087	
Vincent Memorial Hospital*+⊙. Gen	NPAssn		21	14	..	237	
Brookton, 63,797—Plymouth							
Brookton Hospital*+⊙. Gen	NPAssn		126	95	29	463	3,026
Goddard Hospital*+⊙. Gen	Corp		65	47	20	779	1,767
Moore Hospital	Indiv		25	15	8	93	482
Brookline, 47,400—Norfolk							
Bellevue Hospital	NPAssn		30	12	6	22	420
Bournewood Hospital	Indiv		18	7	..	..	1
Brooks Hospital*+⊙. Gen	NPAssn		53	45	..	1,433	
Free Hospital for Women*+⊙. Gyn	NPAssn		101	78	..	2,482	
Trumbull Hospital	NPAssn		50	33	11	107	1,059
Cambridge, 113,643—Middlesex							
Cambridge City Hosp.*+⊙. Gen	City		200	168	32	798	6,206
Cambridge Hospital*+⊙. Gen	NPAssn		213	145	65	697	5,033
Cambridge Sanatorium	City		90	58	..	59	
Charlesgate Hospital	Corp		85	28	10	146	1,870
Chester Hospital	Corp		40	14	20	164	492
Canton, 5,816—Norfolk							
Massachusetts Hosp. School Orth	State		300	256	..	272	
Chelsea, 45,816—Suffolk							
Captain John Adams Hospital at Soldiers' Home*+⊙. Gen	State		263	250	..	2,782	
Chelsea Memorial Hosp.*+⊙. Gen	Corp		85	57	25	399	2,870
U. S. Naval Hospital*+⊙. Gen	Navy		355	220	..	2,778	
Clinton, 12,511—Worcester							
Clinton Hospital*+⊙. Gen	NPAssn		65	28	20	223	1,155
Concord, 7,477—Middlesex							
Emerson Hospital*+⊙. Gen	NPAssn		37	20	12	184	849
Valleyhead	Indiv		29	9	..	166	
Danvers, 12,957—Essex							
Hunt Memorial Hospital*+⊙. Gen	City		20	9	6	64	531
Everett, 48,424—Middlesex							
Whidden Memorial Hosp.*+⊙. Gen	NPAssn		95	91	29	529	3,015
Fall River, 115,274—Bristol							
Fall River General Hospital*+⊙. Gen	Tb		281	212	..	2,253	
St. Anne's Hospital*+⊙. Gen	Church		109	56	26	251	1,591
Trudeau Hospital*+⊙. Gen	NPAssn		134	92	16	347	2,957
Union Hospital*+⊙. Gen	NPAssn		170	129	22	594	3,307
Fitchburg, 40,622—Worcester							
Burbank Hospital*+⊙. Gen	Corp		203	147	33	570	4,168
Lucy Helen Memorial Hosp. Unit of Burbank Hospital							
Forest Hills (Boston P.O.), Suffolk							
Forest Hills General Hosp.*+⊙. Gen	NPAssn		120	60	40	543	2,646
Fort Devens (Ayer P.O.), Middlesex							
Station Hospital*+⊙. Gen	Army		117	50	..	1,520	
Foxboro, 5,347—Norfolk							
Foxboro State Hospital*+⊙. Ment	State		1,425 ¹	1,425	..	529	

MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Framingham, 22,210—Middlesex							
Framingham Union Hosp.*+⊙. Gen	NPAssn		130	74	20	45	2,414
Gardner, 19,399—Worcester							
Gardner State Hospital*+⊙. Ment	State		1,443 ¹	1,410	..	11	
Henry Heywood Memorial Hospital*+⊙. Gen	NPAssn		89	73	17	37	2,416
Georgetown, 1,853—Essex							
Baldpate, Inc. N&M Corp			25	..	..	Estab.	
Gloucester, 24,204—Essex							
Addison Gilbert Hospital*+⊙. Gen	NPAssn		85	66	15	50	2,719
Great Barrington, 5,934—Berkshire							
Fairview Hospital	Gen	NPAssn	50	25	8	131	54
Greenfield, 15,500—Franklin							
Franklin County Public Hospital*+⊙. Gen	NPAssn		87	79	22	24	1,575
Groton, 2,434—Middlesex							
Groton Hospital	Gen	Corp	15	7	4	35	11
Hathorne, 171—Essex							
Danvers State Hospital*+⊙. Ment	State		2,430 ¹	2,335	..	..	50
Haverhill, 48,710—Essex							
Benson Hospital	Gen	Indiv	26	16	2	7	23
Haverhill Municipal Hospitals (Hale)*+⊙. Gen	City		170	106	38	425	455
Haydenville, 1,300—Hampshire							
Hampshire County Sanat... TB	County		100	61	..	..	3
Holbrook, 3,353—Norfolk							
Elmhurst Hospital and Sanitarium	Gen	Indiv	15	5	..	..	3
Holden, 3,871—Worcester							
Holden District Hospital*+⊙. Gen	NPAssn		32	23	6	83	56
Holyoke, 56,537—Hampden							
Holyoke Hospital*+⊙. Gen	NPAssn		144	78	24	231	2,592
Providence Hospital*+⊙. Gen	Church		168	131	32	591	591
Hyannis, 1,800—Barnstable							
Cape Cod Hospital*+⊙. Gen	NPAssn		65	54	15	286	1,790
Ipswich, 5,599—Essex							
Benjamin Stekney Cable Memorial Hospital	Gen	NPAssn	30	16	7	119	50
Lawrence, 85,068—Essex							
Bessie Burke Memorial Hosp. Gen	City		125	100	12	270	2,577
Clover Hill Hospital	Corp		50	26	20	355	1,792
Lawrence General Hosp.*+⊙. Gen	NPAssn		122	89	20	556	3,024
Leominster, 21,810—Worcester							
Leominster Hospital*+⊙. Gen	NPAssn		61	44	12	229	1,752
Lowell, 100,234—Middlesex							
Lowell General Hospital*+⊙. Gen	NPAssn		158	91	20	427	3,571
St. John's Hospital*+⊙. Gen	Church		175	122	29	519	2,996
St. Joseph's Hospital*+⊙. Gen	Church		133	102	21	455	2,511
Shaw Hospital	Indiv		20	5	8	61	133
Ludlow, 8,876—Hampden							
Ludlow Hospital	Gen	NPAssn	30	17	14	221	63
Lynn, 102,320—Essex							
Lynn Hospital*+⊙. Gen	NPAssn		178	141	40	844	6,674
Union Hospital	Gen	NPAssn	53	26	22	408	1,121
Malden, 58,036—Middlesex							
Malden Hospital*+⊙. Gen	NPAssn		239	128	32	708	5,521
Marblehead, 8,608—Essex							
Mary A. Alley Emergency Hospital	Gen	City	15	9	8	84	68
Marlboro, 15,587—Middlesex							
Marlboro Hospital*+⊙. Gen	NPAssn		63	42	23	270	1,203
Medford, 4,066—Norfolk							
Medford State Hospital*+⊙. Ment	State		1,830 ¹	1,841	..	..	21
Medford, 59,714—Middlesex							
Lawrence Memorial Hosp.*+⊙. Gen	NPAssn		75	65	24	771	2,257
Melrose, 23,170—Middlesex							
Melrose Hospital*+⊙. Gen	NPAssn		125	76	20	411	2,252
New England Sanitarium and Hospital	Gen	Church	135	90	17	244	2,708
Middleboro, 8,608—Plymouth							
Lakeville State Sanat.*+⊙. TB	State		302	253	..	167	67
St. Luke's Hospital	Gen	NPAssn	53	17	14	..	..
Middleton, 1,712—Essex							
Essex Sanatorium*+⊙. TB	County		360	341	..	..	..
Millford, 14,741—Worcester							
Millford Hospital*+⊙. Gen	NPAssn		60	39	15	416	1,503
Milton, 16,431—Norfolk							
Milton Hospital and Convalescent Home*+⊙. Gen	NPAssn		27	14	12	70	240
Montague City, 761—Franklin							
Farren Memorial Hosp.*+⊙. Gen	Church		74	50	12	177	1,365
Nantucket, 3,678—Nantucket							
Nantucket Cottage Hospital*+⊙. Gen	NPAssn		23	12	5	50	411
Natick, 13,589—Middlesex							
Leonard Morse Hospital*+⊙. Gen	City		61	40	14	221	1,106
Needham, 10,845—Norfolk							
Glover Memorial Hospital*+⊙. Gen	City		22	14	19	82	605
New Bedford, 112,597—Bristol							
St. Luke's Hospital*+⊙. Gen	NPAssn		234	215	45	801	6,515
Sassaquin Sanatorium*+⊙. TB	Corp		116	106	..	..	..
Union Hospital	Gen	Corp	34	25	3	28	59
Newburyport, 15,084—Essex							
Anna Jacques Hospital*+⊙. Gen	NPAssn		32	41	10	157	1,277
Worcester Memorial Hosp.*+⊙. Gen	NPAssn		25	9	6	72	67
Newton, 65,276—Middlesex							
New England Peabody Home for Crippled Children*+⊙. TBOr	NPAssn		109	59	..	..	..
Newton Hospital*+⊙. Gen	NPAssn		232	152	22	571	2,600
North Adams, 21,621—Berkshire							
North Adams Hospital*+⊙. Gen	NPAssn		61	51	17	253	1,257

Key to symbols and abbreviations is on page 1195

MASSACHUSETTS—Continued

REGISTERED HOSPITALS

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MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Northampton, 24,381—Hampshire	Gen	NPAssn	122	80	24	399	2,632
Cooley Dickinson Hosp. †	Gen	State	2,096 ¹	2,030	732	...	194
Northampton State Hosp. †	Ment	State	1,800 ¹	1,511	...	...	124
Veterans Admin. Facility †	Ment	State	297	239	...	...	161
North Grafton, 2,840—Worcester	Gen	NPAssn	80	88	20	432	2,584
Grafton State Hospital †	Ment	State	29	13	10	95	464
North Wilmington, 472—Middlesex	Ment	State	1,642 ¹	1,545	...	...	130
North Reading State Sanatorium †	Gen	City	35	10	8	89	810
Norwood, 15,049—Norfolk	TbChil	State	65	32	15	229	1,010
Norwood Hospital †	Gen	NPAssn	43	36	10	150	852
Oak Bluffs, 1,333—Dukes	Gen	NPAssn	200	117	33	345	3,568
Martha's Vineyard Hospital	Gen	Church	156	117	33	539	5,201
Palmer, 9,577—Hampden	Gen	NPAssn	50	33	10	173	1,080
Monson State Hospital †	Epil	State	70	61	...	...	237
Wing Memorial Hospital †	Gen	NPAssn	240	197	50	885	6,665
Peabody, 21,345—Essex	Gen	State	30	20	...	...	31
Josiah B. Thomas Hospital	Gen	NPAssn	370	318	...	...	227
Pittsfield, 49,677—Berkshire	Gen	City	63	42	...	...	57
Hillcrest Hospital	Gen	NPAssn	467	427	...	...	1,462
House of Mercy Hosp. †	Gen	NPAssn	50	34	...	...	470
St. Luke's Hospital †	Gen	NPAssn	166	135	30	599	4,711
Plymouth, 13,042—Plymouth	Gen	NPAssn	50	30	...	...	30
Jordan Hospital	Gen	County	110	95	30	692	3,493
Pocasset, 365—Barnstable	Gen	NPAssn	154	150	...	...	128
Barnstable County Sanat. †	TbIso	County	50	25	14	205	857
Quincy, 71,983—Norfolk	Gen	City	80	52	...	...	27
Rutland, 2,442—Worcester	Gen	NPAssn	140	97	...	...	75
Rutland Tuberculosis Sanat. †	Tb	NPAssn	100	71	4	...	251
Rutland State Sanatorium †	Tb	NPAssn	315	200	50	881	5,880
Rutland Training Center †	Tb	NPAssn	60	61	...	...	383
Veterans Admin. Facility †	GenTb	Vet	261	213	4	3	6,223
Salem, 43,353—Essex	Gen	NPAssn	62	48	66	1,376	1,571
North Shore Babies' Hosp. †	Chil	NPAssn	125	78	...	...	2,667
Salem Hospital †	Chil	NPAssn	962 ¹	880	...	...	90
Sharon, 3,351—Norfolk	Gen	NPAssn	50	30	...	...	262
Sharon Sanatorium	Gen	NPAssn	62	47	12	363	2,323
Somerville, 103,908—Middlesex	Tb	NPAssn	1,812 ¹	1,777	...	...	574
Somerville Hospital †	Gen	NPAssn	3,210	2,826	40	93	2,745
South Braintree, —Norfolk	Gen	NPAssn	24	17	...	...	147
South County Hospital †	Tb	NPAssn	1,996 ¹	1,875	...	...	120
Southbridge, 14,264—Worcester	Tb	NPAssn	350	352	...	...	311
Harrington Memorial Hosp. †	Gen	NPAssn	215	83	53	473	2,691
South Dartmouth, 1,815—Bristol	Gen	NPAssn	37	30	13	300	1,250
Sole-Mar Orthopedic Hospital for Children	Orth	NPAssn	35	24	...	...	34
South Hanson, 531—Plymouth	Orth	NPAssn	35	21	...	...	22
Plymouth County Hospital †	Tb	County	1,673 ¹	1,584	...	...	597
Springfield, 149,900—Hampden	Health	County	95	41	13	241	1,475
Health Department Hos-	pitals	City	239	110	...	...	836
Mercy Hospital †	TbIso	City	21	18	...	...	41
Shriners Hospital for Crip-	pled Children	Frnt	70	39	24	514	2,236
Springfield Hospital †	Orth	NPAssn	25	19	8	67	700
Wesson Maternity Hospital †	Gen	NPAssn	65	47	20	289	1,306
Wesson Memorial Hosp. †	Mat	NPAssn	...	...	...	...	...
State Farm, 1,532—Plymouth	Gen	NPAssn	...	...	...	...	...
Bridgewater State Hospital	Ment	State	...	...	...	...	...
Stockbridge, 1,762—Berkshire	Gen	NPAssn	...	...	...	...	...
Austen Riggs Foundation	Nerv	NPAssn	...	...	...	...	...
Taunton, 37,355—Bristol	Gen	NPAssn	...	...	...	...	...
Morton Hospital	Gen	NPAssn	...	...	...	...	...
Taunton State Hospital †	Gen	Corp	...	...	...	...	...
Tewksbury, 5,685—Middlesex	Ment	State	...	...	...	...	...
Tewksbury Hospital and In-	firmary	State	...	...	...	...	...
Vineyard Haven, 1,500—Dukes	Gen	State	...	...	...	...	...
U. S. Marine Hospital	Gen	USPHS	...	...	...	...	...
Waltham, 39,247—Middlesex	Gen	NPAssn	...	...	...	...	...
Metropolitan State Hospital	Ment	State	...	...	...	...	...
Waltham County Sanat. †	Tb	State	...	...	...	...	...
Waltham Contagious Hosp. †	Unit	NPAssn	...	...	...	...	...
Ware, 7,385—Hampshire	Gen	NPAssn	...	...	...	...	...
Mary Lane Hospital	Gen	NPAssn	...	...	...	...	...
Webster, 12,002—Worcester	Gen	NPAssn	...	...	...	...	...
Webster District Hospital	Gen	NPAssn	...	...	...	...	...
Wellesley, 11,439—Norfolk	Gen	NPAssn	...	...	...	...	...
Channing Sanitarium	N&M	Corp	...	...	...	...	...
Wiswall Sanitarium	N&M	Corp	...	...	...	...	...
Westboro, 6,409—Worcester	Gen	NPAssn	...	...	...	...	...
Westboro State Hospital †	Ment	State	...	...	...	...	...
Westfield, 19,775—Hampden	Gen	NPAssn	...	...	...	...	...
Noble Hospital	Gen	NPAssn	...	...	...	...	...
Westfield State Sanat. †	Tb	NPAssn	...	...	...	...	...
Westwood, 2,697—Norfolk	Gen	NPAssn	...	...	...	...	...
Westwood Lodge	N&M	Corp	...	...	...	...	...
Weymouth, 29,852—Norfolk	Gen	NPAssn	...	...	...	...	...
Whitinsville, 6,000—Worcester	Gen	NPAssn	...	...	...	...	...
Whitinsville Hospital	Gen	NPAssn	...	...	...	...	...
Winchendon, 6,202—Worcester	Gen	NPAssn	...	...	...	...	...
Millers River Hospital	Gen	Corp	...	...	...	...	...
Winchester, 12,719—Middlesex	Gen	NPAssn	...	...	...	...	...
Winchester Hospital	Gen	NPAssn	...	...	...	...	...

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Winthrop, 16,852—Suffolk	Gen	NPAssn	100	78	6	60	1,174
Winthrop Hospital †	Gen	NPAssn	44	37	20	410	1,284
Woburn, 19,434—Middlesex	Gen	NPAssn	42	35	19	259	1,378
Charles Choate Memorial Hospital	Gen	NPAssn	250	132	...	...	703
Worcester, 195,311—Worcester	TbIso	City	47	34	18	194	1,179
Belmont Hospital †	Gen	NPAssn	25	3	5	15	338
Fairlawn Hospital	Gen	Corp	185	157	59	634	6,396
Harvard Private Hospital	Gen	NPAssn	225	174	25	571	6,088
St. Vincent Hospital †	Gen	Church	480	360	60	1,263	11,181
Worcester City Hosp. †	Gen	City	130	124	...	...	118
Worcester County Sanat. †	Tb	County	113	71	27	489	2,557
Worcester Hahnemann Hos-	pital	State	2,445 ¹	2,382	8	10	821
Wrentham, 3,584—Norfolk	Gen	NPAssn	147	128	...	...	1,578
Pondville Hospital at Nor-	folk	State	50	10	...	...	915
Related Institutions							
Andover, 9,969—Essex	Inst	NPAssn	125	100	...	...	30
Isham Infirmary	Inst	NPAssn	32	15	5	109	604
Baldwinsville, 2,300—Worcester	Inst	NPAssn	56	55	...	...	416
Hospital Cottages for Chil-	dren	State	25	12	...	...	300
Belchertown, 3,139—Hampshire	Chil	NPAssn	21	11	47	104	105
Belchertown State School	MeDe	State	26	3	...	...	128
Boston, 781,188—Suffolk	Gen	NPAssn	44	16	6	...	361
Audubon Hospital	Gen	NPAssn	75	45	...	...	235
Bay State Hospital	Gen	NPAssn	32	5	6	11	140
Boston Home for Incurables	ChrOr	NPAssn	18	23	17	59	77
Deer Island Hospital	Inst	NPAssn	32	6	...	...	204
Florence Crittenton Home	Inst	NPAssn	25	7	...	...	479
MacLeod Hospital	Mat	NPAssn	12	6	...	...	30
Massachusetts State Prison	Gen	Corp	55	30	...	...	122
New England Home for Lit-	Inst	State	215	211	...	...	340
The Wanderers	Inst	NPAssn	50	46	...	...	101
Preridgerast Preventorium	Tb	NPAssn	22	...	...	...	...
Riverbank Hospital	Tb	NPAssn	21	17	...	...	45
Talitha Cumi Home	Gen	NPAssn	20	2	...	...	62
Dr. Taylor's Private Hosp.	Mat	NPAssn	40	13	...	...	94
Washington Hospital	Drug	NPAssn	90	43	...	...	87
Braintree, 15,712—Norfolk	Alcoh	NPAssn	75	8	...	...	121
Braintree Convalescent Hosp.	Conv	NPAssn	50	12	...	...	66
Eaton Sunshine Hospital	Conv	NPAssn	94	94	...	...	109
Brookline, 47,490—Norfolk	Conv	NPAssn	25	16	9	297	594
Board of Health Hospital	TbIso	City	9	4	...	...	1
Cambridge, 113,643—Middlesex	TbIso	City	75	33	...	...	638
Holy Ghost Hospital for In-	curables	Church	8	3	...	...	5
Egypt, 340—Plymouth	Gen	NPAssn	14	9	...	...	15
Children's Sunlight Hosp.	Orth	NPAssn	60	8	...	...	50
Falmouth, 4,821—Barnstable	High Fields	Conv	...	...	...	...	...
Woodsdale Cottages	Conv	Corp	...	...	...	...	...
Greenfield, 15,500—Franklin	Conv	Corp	...	...	...	...	...
Greenfield Isolation Hosp.	Iso	City	...	...	...	...	...
Haverhill, 48,710—Essex	Iso	City	...	...	...	...	...
Haverhill City Infirmary	Inst	City	...	...	...	...	...
Haverhill Municipal Hos-	pitals	City	...	...	...	...	...
Lowell, 100,234—Middlesex	Iso	City	...	...	...	...	...
Lowell Isolation Hospital	TbIso	City	...	...	...	...	...
Lynn, 102,320—Essex	Iso	City	...	...	...	...	...
Lynn Isolation Hospital	Iso	City	...	...	...	...	...
Malden, 58,036—Middlesex	Iso	City	...	...	...	...	...
Malden Contagious Hospital	TbIso	City	...	...	...	...	...
Marblehead, 5,668—Essex	Children's	City	...	...	...	...	...
Children's Island Sanit.	Conv	NPAssn	...	...	...	...	...
Methuen, 21,009—Essex	Conv	NPAssn	...	...	...	...	...
Mary E. McGowan Memorial	Hospital	Gen	...	...	...	...	...
Newton, 63,276—Middlesex	Gen	NPAssn	...	...	...	...	...
Woodlawn Sanitarium	Epil	Indiv	...	...	...	...	...
Norfolk, 1,429—Norfolk	Prison	State	...	...	...	...	...
Hospital of Norfolk State	Colon	Inst	...	...	...	...	...
Pittsfield, 49,677—Berkshire	Frederic S. Coolidge Me-	State	...	...	...	...	...
morial Home	Anti-Tuberculosis	Tb	...	...	...	...	...
Pittsfield Hospital	Tb	NPAssn	...	...	...	...	...
Quincy, 71,983—Norfolk	Tb	NPAssn	...	...	...	...	...
Wellington Hospital Home	Conv	Corp	...	...	...	...	...
Salem, 43,353—Essex	for Contagious Diseases	Iso	...	...	...	...	...
Somerville, 103,908—Middlesex	Contagious Dis-	City	...	...	...	...	...
Springfield, 149,900—Hampden	Iso	City	...	...	...	...	...
Buscall Nursing Home	Conv	Indiv	...	...	...	...	...
City of Springfield Infirmary	Inst	City	...	...	...	...	...

Key to symbols and abbreviations is on page 1195

MASSACHUSETTS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Swampscott, 10,346—Essex							
Ocean View Hospital.....	Gen	Part	16	11	12	120	171
Waltham, 39,247—Middlesex							
Teresian Lying-In Hospital..	Mat	Indiv	10	9	10	196	193
Walter E. Fernald State School	MeDe	State	1,962†	1,923	..	..	71
Waltham Baby Hospital....	Chil	NPAssn	22	8	..	..	42
Wellesley, 11,439—Norfolk							
Convalescent Home of the Children's Hospital	Conv	NPAssn	85	62	..	..	484
Simpson Infirmary of Wellesley College	Inst	NPAssn	20	12	..	..	678
West Concord, 1,851—Middlesex							
Massachusetts Reformatory Hospital	Inst	State	50	4	..	..	108
Whitman, 7,638—Plymouth							
Whitman Hospital	Gen	Indiv	12	5	6	23	55
Williamstown, 3,900—Berkshire							
Williams College Infirmary..	Inst	NPAssn	21	7	..	..	390
Wrentham, 3,584—Norfolk							
Wrentham State School.....	MeDe	State	2,057†	1,948	..	..	109

MICHIGAN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Adrian, 13,064—Lenawee							
Emma L. Bixby Hospital... Gen	City		45	35	15	316	1,292
Albion, 8,324—Calhoun							
James W. Sheldon Memorial Hospital..	Gen	City	40	16	10	80	948
Alma, 6,734—Gratiot							
Carney-Wilcox Hospital Gen	Part		33	16	6	78	460
R. B. Smith Memorial Hosp. Gen	NPAssn		27	15	5	119	622
Ann Arbor, 26,944—Washtenaw							
Mercywood Neuropsychiatric Hospital	N&M	Church	40	23	..	..	181
St. Joseph's Mercy Hosp.*† Gen	Church		135	112	20	370	3,302
State Psychopathic Hospital, Unit of University Hospital*† Gen	State		1,725	1,103	35	506	23,847
Bad Axe, 2,332—Huron							
Hubbard Memorial Hospital Gen	NPAssn		25	21	6	99	563
Battle Creek, 43,573—Calhoun							
American Legion Hospital*† TB	State		350	208	..	..	219
Battle Creek Sanitarium*† Gen	NPAssn		500	140	..	..	5,144
Calhoun County Public Hospital	TB	County	75	54	..	..	88
Community Hospital*† Gen	NPAssn		100	57	24	529	4,764
Lella Y. Post Montgomery Hospital*† Gen	Church		140	73	17	410	3,713
Bay City, 47,353—Bay							
Bay City General Hospital*† Gen	City		73	44	10	249	1,341
Bay City Samaritan Hosp. Gen	NPAssn		43	25	4	34	1,165
Mercy Hospital*† Gen	Church		119	75	21	407	4,247
Benton Harbor, 15,431—Berrien							
Mercy Hospital*† Gen	NPAssn		70	49	12	262	1,933
Big Rapids, 4,671—Mecosta...							
Community Hospital	City		33	12	9	89	544
Brighton, 1,237—Livingston							
Mellus Hospital	Indiv		12	6	4	24	238
Cadillac, 9,570—Wexford							
Mercy Hospital	Church		55	34	8	106	1,763
Calumet, 1,557—Houghton							
Calumet and Hecla Hospital Indus	NPAssn		20	7	..	..	433
Camp Custer, —Kalamazoo							
Veterans Admin. Facility*† Ment	Vet		1,010	1,018	..	..	322
Caro, 2,534—Tuscola							
Caro Community Hospital. Gen	City		16	7	6	109	309
Charlevoix, 2,247—Charlevoix							
Charlevoix Hospital	NPAssn		23	22	8	122	724
Charlotte, 5,297—Eaton							
Hayes-Green Memorial Hosp. Gen	County		23	10	6	136	709
Clare, 1,491—Clare							
Clare County General Hosp. Gen	Indiv		17	11	3	39	400
Coldwater, 6,735—Branch							
Community Health Center.. Gen	County		51	..	9	Estab. 1933	..
Dearborn, 50,238—Wayne							
St. Joseph's Retreat*† N&M	Church		330	297	..	..	335
Veterans Admin. Facility.....	Vet		351	..	..	Estab. 1933	..
Detroit, 1,565,602—Wayne							
Alexander Blain Hospital*† Gen	NPAssn		69	43	5	52	1,696
Bethesda Hospital*† TB	NPAssn		83	81	..	..	109
Charles Godwin Jennings Hospital*† Gen	NPAssn		66	27	12	105	1,321
Chenik Hospital*† TB	NPAssn		32	46	..	..	57
Children's Hospital*† Gen	NPAssn		229	196	..	..	7,159
City of Detroit Receiving Hospital*† Gen	City		616	658	6	14	29,831
City of Detroit Receiving Hospital*† Gen	City		20	37	..	..	1,574
City of Detroit Receiving Hospital*† Gen	NPAssn		45	34	11	244	1,845
City of Detroit Receiving Hospital*† Gen	NPAssn		49	52	15	529	2,375
City of Detroit Receiving Hospital*† Gen	NPAssn		139	176	..	..	297
City of Detroit Receiving Hospital*† Gen	NPAssn		89	62	35	897	2,616

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Edyth K. Thomas Memorial Hospital	Gen	NPAssn	133	99	17	37	1,111
Evangelical Deaconess Hospital*† Gen	Church		175	156	30	1,061	1,117
Fairview Sanatorium	TB	NPAssn	66	64	..	..	1,117
Florence Crittenton Hosp.*† Gen	NPAssn		140	91	109	2,961	1,117
Good Samaritan Hospital....	TB	NPAssn	29	27	..	..	1,117
Grace Hospital*† Gen	NPAssn		487	412	79	2,264	1,117
Grosse Pointe Hospital.....	Gen	Indiv	35	17	12	7	1,117
Harper Hospital*† Gen	NPAssn		690	374	108	1,611	1,117
Henry Ford Hospital*† Gen	NPAssn		589	402	24	72	1,117
Herman Kiefer Hosp.*† Contag Ob	City		1,233	1,030	63	2,120	1,117
Lincoln Hospital	Gen	NPAssn	90	56	14	315	1,117
Marr General Hospital.....	Gen	NPAssn	35	14	10	16	1,117
Michigan Mutual Hospital*† Indus	NPAssn		42	19	..	..	1,117
Miriam Memorial Hospital... Unit of Grace Hospital	Church		265	114	69	70	1,117
Mt. Carmel Mercy Hospital*† Gen	NPAssn		53	35	2	7	1,117
Parkside Hospital*† Gen	Church		424	316	100	2,011	1,117
Providence Hospital*† Gen	Church		48	25	5	1	1,117
St. Aubin General Hospital. Gen	Church		185	124	39	1,042	1,117
St. Joseph's Mercy Hosp.*† Gen	Church		320	180	55	1,004	1,117
St. Mary's Hospital*† Gen	NPAssn		40	23	10	16	1,117
Saratoga General Hospital. Gen	Indiv		85	50	1	1	1,117
Shurly Hospital*† Gen	Army		60	45	..	..	1,117
Station Hospital	NPAssn		140	42	12	15	1,117
Trinity Hospital*† Gen	USPHS		291	220	..	..	1,117
U. S. Marine Hospital*† Gen	Indiv		18	12	3	21	1,117
Warren Diagnostic Hospital. Gen	Indiv		36	23	..	..	1,117
West Fort Hospital.....	NPAssn		225	166	100	2,522	1,117
Woman's Hospital*† Gen	Church		25	8	7	6	1,117
Dowagiac, 5,550—Cass							
Lee Memorial Hospital.....	NPAssn		13	7	4	50	1,117
Durand, 3,081—Shiawassee							
Durand Hospital	Gen		13	7	4	50	1,117
Eaton Rapids, 2,822—Eaton							
Harriet Chapman Memorial Hospital	Gen	Part	19	4	3	17	1,117
Edmore, 897—Montcalm							
Edmore Hospital	Gen	Indiv	17	5	3	45	1,117
Eloise, 710—Wayne							
Eloise Hospital and Infirmary*† Ment	County		3,683	3,610	..	..	1,117
William J. Seymour Hosp.*† Acute General Unit of Eloise Hospital and Infirmary	Chr		1,437	1,402	..	..	1,117
Escanaba, 14,524—Delta							
St. Francis Hospital.....	Gen	Church	75	56	20	49	1,117
Flint, 156,492—Genesee							
Hurley Hospital*† Gen	City		367	250	50	1,022	1,117
St. Joseph's Hospital.....	Gen	Church	110	67	25	63	1,117
Women's Hospital*† Gen	NPAssn		41	34	26	67	1,117
Fremont, 2,157—Newaygo							
Gerber Memorial Hospital.. Gen	City		20	11	5	58	1,117
Gaylord, 1,627—Otsego							
Northern Michigan Tuberculosis Sanatorium	TB	State	132	102	2	5	1,117
Goodrich, 324—Genesee							
Goodrich General Hospital*† Gen	NPAssn		21	16	5	71	1,117
Grand Haven, 8,345—Ottawa							
Grand Haven Municipal Hospital	Gen	City	47	..	..	New 1934	1,117
Grand Rapids, 168,502—Kent							
Blodgett Memorial Hosp.*† Gen	NPAssn		132	90	13	58	1,117
Butterworth Hospital*† Gen	NPAssn		272	129	45	924	1,117
Christian Psychopathic Hospital	N&M	NPAssn	270	239	..	..	1,117
City General Hospital.....	Gen	City	35	29	..	..	1,117
Ferguson - Droste - Ferguson Sanitarium	Proct	Corp	33	14	..	..	1,117
St. Mary's Hospital*† Gen	Church		220	147	35	122	1,117
Sunshine Sanatorium	TB	CyCo	145	121	..	..	1,117
Grayling, 1,973—Crawford							
Grayling Mercy Hospital*† Gen	Church		59	21	5	61	1,117
Greenville, 4,730—Montcalm							
United Memorial Hospital.. Gen	NPAssn		19	11	6	89	1,117
Hamtramck, 56,268—Wayne							
St. Francis Hospital*† Gen	Church		125	55	29	45	1,117
Hancock, 5,795—Houghton							
St. Joseph's Hospital*† Gen	Church		85	59	15	100	1,117
Hart, 1,600—Oceana							
Oceana Hospital	Gen	NPAssn	15	16	4	81	1,117
Hastings, 5,227—Barry							
Pennock Hospital	Gen	NPAssn	39	11	6	176	1,117
Highland Park, 62,920—Wayne							
Highland Park General Hospital*† Gen	City		156	129	34	577	1,117
Hillsdale, 5,520—Hillsdale							
Hillsdale Hospital	Gen	City	26	22	6	150	1,117
Holland, 14,240—Ottawa							
Holland City Hospital.....	Gen	City	4	32	15	20	1,117
Houghton, 2,757—Houghton							
Copper Country Sanatorium TB	County		56	54	..	..	1,117
Howell, 5,015—Livinston							
McPherson Memorial Hosp. Gen	City		25	8	7	81	1,117
Michigan State Sanatorium*† TB	State		499	436	..	..	1,117
Ionia, 6,262—Ionia							
Ionia State Hospital.....	State		249	209	..	..	1,117

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Iron Mountain, 11,632—Dickinson							
Iron Mountain General Hospital	Gen	City	28	18	8	158	822
Ironwood, 14,290—Gogebic							
Grand View Hospital	Gen	TB County	120	71	11	135	1,330
Newport Hospital	Gen	NPAssn	12	4	4	92	285
Twin City Hospital	Gen	Indiv	19	12	3	34	236
Ishpeming, 9,238—Marquette							
Ishpeming Hospital	Gen	NPAssn	45	40	10	231	1,156
Jackson, 55,187—Jackson							
W. A. Foote Memorial Hospital	Gen	City	150	115	23	720	4,731
Jackson County Sanatorium	TB	County	68	71	..	..	48
Mercy Hospital	Gen	Church	125	71	25	492	4,001
Kalamazoo, 54,786—Kalamazoo							
Borgess Hospital	Gen	Church	214	123	27	675	4,672
Bronson Methodist Hosp.	Gen	Church	95	73	27	632	3,411
Fairmount Hospital	Gen	County	123	69	..	..	283
Kalamazoo State Hospital	Ment	State	2,765 ¹	2,700	..	..	996
Lakeview, 850—Montcalm							
Kelsey Hospital	Gen	Part	20	7	4	72	460
Lansing, 78,397—Ingham							
Edward W. Sparrow Hospital	Gen	NPAssn	150	116	25	1,251	5,272
Ingham Sanatorium	TB	County	130	116	..	..	204
St. Lawrence Hospital	Gen	Church	145	91	30	778	4,970
Laurium, 4,916—Houghton							
Calumet Public Hospital	Gen	NPAssn	30	20	6	161	1,103
Ludington, 8,898—Mason							
Paulina Stearns Hospital	Gen	NPAssn	23	15	3	132	625
Manistee, 8,078—Manistee							
Mercy Hospital and Sanit.	Gen	Church	50	27	6	86	3,140
Manistique, 5,193—Schoolcraft							
Shaw General Hospital	Gen	Indiv	20	12	10	64	361
Marquette, 14,780—Marquette							
Morgan Heights Sanat.	TB	County	90	71	..	..	90
St. Luke's Hospital	Gen	NPAssn	140	86	10	176	2,227
St. Mary's Hospital	Gen	Church	60	45	9	67	903
Marshall, 5,019—Calhoun							
Oak Lawn Hospital	Gen	NPAssn	17	10	7	111	524
Menominee, 10,320—Menominee							
St. Joseph's Hospital	Gen	Church	55	44	13	312	1,763
Monroe, 18,110—Monroe							
Mercy Hospital	Gen	Church	56	33	15	230	1,377
Monroe Hospital	Gen	NPAssn	68	54	12	288	2,736
Morenci, 1,773—Lenawee							
Blanchard Hospital	Gen	Part	15	8	6	52	466
Mt. Clemens, 13,497—Macomb							
St. Joseph Sanitarium and Hospital	Gen	Church	112	94	18	333	2,265
Station Hospital	Gen	Army	37	29	4	34	803
Mt. Pleasant, 5,211—Isabella							
McArthur-Strange Hospital	Gen	Part	25	17	5	47	878
Mt. Pleasant Community Hospital	Gen	NPAssn	24	19	4	133	770
Munising, 3,956—Alger							
Munising Hospital	Gen	NPAssn	24	10	4	65	670
Muskegon, 11,390—Muskegon							
Hackley Hospital	Gen	NPAssn	108	74	17	624	3,079
Mercy Hospital	Gen	Church	100	70	25	725	3,547
Muskegon County Sanat.	TB	County	70	69	..	..	65
Newberry, 2,465—Luce							
Newberry State Hospital	Ment	State	1,300 ¹	1,300	..	..	300
Perry-Splunks Hospital	Gen	Part	22	9	8	94	350
Niles, 11,326—Barren							
Pawating Hospital	Gen	NPAssn	38	17	9	150	899
Northville, 2,560—Wayne							
East Lawn Sanatorium	TB	Corp	95	92	..	..	61
Sessions Private Hospital	Gen	Indiv	21	10	6	112	3,650
Wm. H. Maybury Sanat.	TB	City	843	791	..	..	653
Norway, 4,016—Dickinson							
Penn Iron Mining Company Hospital	Gen	Corp	15	7	5	97	265
Ontonagon, 1,937—Ontonagon							
Ontonagon Hospital	Gen	Indiv	17	12	4	51	507
Oshkemo, 1,620—Kalamazoo							
Pine Crest Sanatorium	TB	Corp	128	115	..	..	101
Owosso, 14,496—Shiawassee							
Memorial Hospital	Gen	NPAssn	80	51	15	398	2,089
Petoskey, 5,740—Emmet							
Little Traverse Hospital	Gen	NPAssn	68	51	6	53	911
Lockwood General Hospital	Gen	City	60	31	8	140	1,093
Plainwell, 2,279—Allegan							
Wm. Crispe Hospital	Gen	City	20	12	6	115	547
Pontiac, 64,928—Oakland							
Oakland County Contagious Hospital	Iso	County	85	39	..	..	831
Oakland County Tuberculosis Sanatorium	TB	County	193	186	..	..	211
Pontiac General Hospital	Gen	City	112	96	26	484	4,241
Pontiac State Hospital	Ment	State	1,872 ¹	1,833	..	..	281
St. Joseph Mercy Hosp.	Gen	Church	150	102	30	990	3,974
Port Huron, 31,361—St. Clair							
Port Huron Hospital	Gen	NPAssn	120	74	15	293	2,562
Powers, 330—Menominee							
Pinecrest Sanatorium	TB	Counties	145	127	..	..	136
Red City, 1,792—Oscoda							
Red City Hospital	Gen	City	30	12	6	63	459

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
River Rouge, 17,314—Wayne							
Sidney A. Sumbly Memorial Hospital	Gen	Indiv	30	20	5	46	353
Royal Oak, 22,904—Oakland							
Royal Oak Hospital	Gen	Indiv	19	13	4	67	546
Saginaw, 80,715—Saginaw							
Saginaw City Hospital	Gen	City	26	16	5	59	326
Saginaw County Hospital	TB Iso	County	175	133	..	..	564
Saginaw General Hosp.	Gen	NPAssn	129	96	23	546	3,638
St. Luke's Hospital	Gen	Church	54	44	15	478	1,794
St. Mary's Hospital	Gen	Church	150	117	27	566	3,943
St. John's, 3,920—Clinton							
Clinton Memorial Hospital	Gen	NPAssn	48	36	11	186	2,137
St. Joseph, 8,349—Berrien							
St. Joseph Sanitarium	Gen	NPAssn	32	17	12	156	769
Sault Ste. Marie, 13,755—Chippewa							
Chippewa County War Memorial Hospital	Gen	County	92	63	15	366	2,156
Station Hospital	Gen	Army	64	41	..	..	691
South Haven, 4,804—Van Buren							
Penoyar Memorial Hospital	Gen	Indiv	12	3	6	16	101
Stambaugh, 2,400—Iron							
General Hospital Company of Iron River District	Gen	NPAssn	27	15	6	122	761
Sturgis, 6,950—St. Joseph							
Sturgis Memorial Hospital	Gen	City	40	24	10	239	981
Tecumseh, 2,456—Lenawee							
Tecumseh Hospital	Gen	City	22	11	8	81	400
Three Rivers, 8,863—St. Joseph							
Three Rivers Hospital	Gen	City	28	24	6	134	891
Traverse City, 12,539—Grand Traverse							
Central Michigan Children's Clinic	Chil	State	26	20	..	..	644
James Decker Munson Hospital	Gen	State	130	82	14	368	2,038
Traverse City State Hospital	Ment	State	2,340 ¹	2,393	..	..	402
Trimountain, 2,541—Houghton							
Copper Range Hospital	Gen	NPAssn	20	9	5	41	287
Wayne, 3,423—Wayne							
Wayne General Hospital	Gen	NPAssn	30	8	6	52	281
West Branch, 1,164—Ogemaw							
Toifree Memorial Hospital	Gen	City	20	10	6	48	490
Wyandotte, 28,368—Wayne							
Wyandotte General Hosp.	Gen	City	150	94	32	750	3,730
Ypsilanti, 10,143—Washtenaw							
Beyer Memorial Hospital	Gen	City	30	20	9	285	895
Hull Memorial City Hospital	Unit of	Beyer Memorial Hospital					
Leland Sanatorium	TB	NPAssn	135	82	..	..	74
Ypsilanti State Hospital	Ment	State	2,370 ¹	2,633	..	..	1,552
Zeeland, 2,850—Ottawa							
Thomas G. Huizinga Memorial Hospital	Gen	NPAssn	14	7	3	52	259
Related Institutions							
Adrian, 13,064—Lenawee							
Lenawee County Tuberculosis Sanatorium	TB	County	32	28	..	..	55
Allegan, 3,941—Allegan							
Allegan General Hospital	Gen	Part	12	6	4	35	268
Alma, 6,734—Gratiot							
Michigan Masonic Home and Hospital	Inst	Frat	45	28	..	..	129
Ann Arbor, 26,944—Washtenaw							
Cowle Hospital	Gen	Indiv	9	2	..	..	177
Cassopolis, 1,448—Cass							
McCutcheon Hospital	Gen	Indiv	8	2	4	19	101
Coldwater, 6,735—Branch							
Coldwater State Home and Training School	MeDe	State	250 ¹	228	..	..	25
Crystal Falls, 2,995—Iron							
Iron County Infirmary	Gen	County	14	8	..	..	238
Detroit, 1,568,662—Wayne							
Burns Home Sanitarium	TB	Indiv	78	75	..	..	136
De Nike Sanitarium	Alcoh	Corp	15	10	..	..	156
Doctor's Hospital	Conv	Indiv	45	20	..	..	..
Mercy Hospital	Gen	Indiv	47	10	5	27	300
St. Luke's Convalescent Home	Conv	Church	25	15	..	..	169
William Booth Memorial Hospital	Mut	Church	50	32	10	333	385
Douglas, 368—Allegan							
Community Hospital	Gen	Indiv	11	5	3	31	216
Farmington, 1,243—Oakland							
Children's Hospital Convalescent Home	Conv	NPAssn	200	115	..	..	405
Ferndale, 20,835—Oakland							
Ardmore Hospital	Gen	Indiv	14	9	8	164	312
Flint, 156,492—Genesee							
Genesee County Hospital and Infirmary	InstGen	County	115	92	17	167	1,040
Grand Rapids, 168,592—Kent							
Kent County Receiving Hospital	Ment	County	32	19	..	..	398
Michigan Soldiers' Home	Inst	State	250	150	..	..	758
Municipal Isolation Hospital	Iso	City	22	16	..	..	277
Salvation Army Evangeline Booth Home and Hospital	Mat	Church	90	51	23	209	153

MICHIGAN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Hazel Park, —Oakland							
Helene Melke Hospital.....	Gen	Indiv	12	5	8	55	256
Ionia, 6,562—Ionia							
Michigan State Reformatory Inst		State	22	11	..	...	815
Jackson, 53,187—Jackson							
Florence Crittenton Home and Hospital	Mat	NPAasn	25	17	12	30	51
Jackson County Isolation Hospital	Iso	County	31	7	..	...	169
Southern Michigan Prison Hospital	Inst	State	200	121	..	...	3,203
Lansing, 78,397—Ingham							
Boys' Vocational School							
Hospital	Inst	State	50	9	..	...	721
Lansing City Hospital.....	Iso	CyCo	42	21	..	...	437
Lapeer, 5,008—Lapeer							
Lapeer City Hospital.....	Gen	Part	18	6	4	32	345
Lapeer State Home and Training School+	MeDe	State	3,886 ¹	3,859	..	...	232
Marquette, 14,789—Marquette							
Hospital of the State House of Correction and Branch Prison	Inst	State	24	4	..	...	133
Mt. Clemens, 13,497—Macomb							
Sigma Gamma Hospital School	Orth	NPAasn	50	37	..	...	127
Mt. Pleasant, 5,211—Isabella							
Mt. Pleasant State Home and Training School.....	MeDe	State	327 ¹	314	..	...	19
Northville, 2,566—Wayne							
Wayne County Training School	MeDe	County	835	652	..	...	157
Otter Lake, 336—Lapeer							
American Legion Children's Bilet	TB	Frat	125	112	..	...	100
Plymouth, 4,484—Wayne							
Plymouth Hospital	Gen	Part	10	3	3	52	210
Pontiac, 64,928—Oakland							
Oakland County Infirmary..	Inst	County	240	200	..	...	874
Port Huron, 31,361—St. Clair							
Port Huron Emergency Hospital	Iso	City	24	3	..	...	47
Rochester, 3,554—Oakland							
Haven Sanitarium	N&M	Corp	45	31	..	...	171
Rockland, 700—Ontonagon							
Ontonagon County Sanat... TB	County	County	20	15	..	...	12
Rogers City, 3,278—Presque Isle							
Rogers City Hospital.....	Gen	Indiv	5	3	..	...	76
Romco, 2,283—Macomb							
Wehenkel Sanatorium	TB	Indiv	40	37	..	...	74
Royal Oak, 22,904—Oakland							
Sunnybrook Hospital	Gen	NPAasn	20	10	7	96	463
St. Clair, 3,389—St. Clair							
St. Clair Community Hosp..	Gen	City	12	7	5	107	491
Shelby, 1,152—Oceana							
Shelby Hospital	Gen	City	10	4	4	46	194
Stockbridge, 715—Ingham							
Rowe Memorial Hospital....	Gen	Part	10	5	3	51	161
Traverse City, 12,533—Grand Traverse							
Grand Traverse County Hospital	Gen	County	23	13	2	21	330
Vicksburg, 1,755—Kalamazoo							
Franklin Memorial Hospital	Gen	City	9	4	2	30	242
Wahjamega, 111—Tuscola							
Caro State Hospital.....	Epil	State	1,027 ¹	1,003	..	...	44

MINNESOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Ada, 1,287—Norman							
Normal County Memorial Hospital	Gen	Corp	10	5	3	51	189
Adrian, 1,000—Nobles							
Adrian Hospital	Gen	NPAasn	14	4	5	83	252
Ab-gwah-ching, 45—Cass							
Minnesota State Sanat... TB	State	State	4-9	400	..	...	437
Albert Lea, 10,100—Freeborn							
Naeve Hospital	Gen	NPAasn	72	53	14	434	2,841
Alexandria, 2,876—Douglas							
Douglas County Hospital... Gen	NPAasn	Indiv	29	12	6	60	418
St. Luke's Hospital.....	Gen	Indiv	17	6	6	45	211
Appleton, 1,425—Swift							
Kaufman Hospital	Gen	Indiv	29	9	5	28	612
Austin, 12,276—Mower							
St. Olaf Lutheran Hospital. Gen	Church	Church	29	45	12	286	2,119
Battle Lake, 352—Otter Tail							
Otter Tail County Sanat... TB	County	County	45	27	..	...	38
Belleville, 7,202—Beltrami							
Lutheran Hospital	Gen	NPAasn	29	32	8	248	1,377
Pewagon, 2,005—Swift							
Swift County Hospital.....	Gen	NPAasn	29	19	5	102	511

MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Biwabik, 1,383—St. Louis							
Biwabik Hospital	Gen	Indiv	12	6	5	57	24
Blue Earth, 2,884—Faribault							
Blue Earth Hospital.....	Gen	Indiv	10	5	4	34	1
Brainerd, 10,221—Crow Wing							
St. Joseph's Hospital... Gen	Church	Church	73	43	15	25	14
Breckenridge, 2,264—Wilkin							
St. Francis Hospital... Gen	Church	Church	60	37	10	52	14
Buffalo, 1,409—Wright							
Catlin Hospital	Gen	Part	12	3	3	29	7
Canby, 1,738—Yellow Medicine							
John Swenson Memorial Hospital	Gen	City	18	7	5	69	22
Cannon Falls, 1,358—Goodhue							
Mineral Springs Sanatorium TB	Counties	Counties	100	90	..	...	6
Cass Lake, 1,409—Cass							
Cass Lake General Hospital	Gen	NPAasn	20	3	4	11	1
Cass Lake Indian Hospital. Gen	IA	IA	52	21	4	8	13
Chisholm, 8,308—St. Louis							
Rood Hospital	Gen	Indiv	12	6	3	65	27
Clarkfield, 802—Yellow Medicine							
Clarkfield Community Hosp. Gen	Indiv	Indiv	10	6	4	57	5
Cloquet, 6,782—Carlton							
Eppard Hospital	Gen	Indiv	8	2	4	26	4
Fond du Lac Indian Hosp.. Gen	IA	IA	21	16	4	48	4
Raiter Hospital	Gen	Part	42	15	7	77	6
Crookston, 6,321—Polk							
Bethesda Hospital	Gen	Church	40	33	10	139	152
St. Vincent's Hospital.....	Gen	Church	50	41	10	166	117
Sunnyrest Sanatorium	TB	Counties	72	62	..	...	6
Crosby, 3,451—Crow Wing							
Miner's Hospital	Gen	Indiv	22	9	6	63	14
Dawson, 1,386—Lac qui Parle							
Dawson Hospital	Gen	Corp	25	12	4	56	20
Deerwood, 552—Crow Wing							
Deerwood Sanatorium	TB	Counties	27	23	..	...	11
Detroit Lakes, 3,675—Becker							
St. Mary's Hospital.....	Gen	Church	21	19	6	138	123
Duluth, 101,463—St. Louis							
Miller Memorial Hospital... Gen	City	City	50	23	..	...	22
St. Luke's Hospital... Gen	NPAasn	NPAasn	247	185	31	867	677
St. Mary's Hospital... Gen	Church	Church	270	222	39	885	523
Webber Hospital	Gen	Indiv	40	21	10	156	112
Ely, 6,156—St. Louis							
Shipman Hospital	Gen	Part	15	6	6	73	27
Eveleth, 7,454—St. Louis							
More Hospital	Gen	Corp	30	16	8	91	67
Fairmont, 5,521—Martin							
Bailey Hospital	Gen	Indiv	10	5	5	74	22
Fairmont Clinic and Hosp.. Gen	Corp	Corp	26	9	12	62	27
Gardner Hospital	Gen	Indiv	8	3	2	15	6
Hunt Hospital	Gen	Indiv	12	5	5	29	29
Faribault, 12,767—Rice							
St. Lucas Evangelical Deaconess Hospital	Gen	Church	48	39	16	231	122
Farmington, 1,342—Dakota							
Community Hospital	Gen	Indiv	24	15	4	59	59
Fergus Falls, 9,389—Otter Tail							
Fergus Falls State Hosp... Ment	State	State	2,000 ¹	1,782	..	...	57
George B. Wright Memorial Hospital	Gen	NPAasn	50	39	12	162	136
St. Luke's Hospital... Gen	NPAasn	NPAasn	54	21	9	171	93
Fort Snelling, 1,327—Hennepin							
Station Hospital	Gen	Army	168	125	5	10	1,34
Fosston, 978—Polk							
Fosston Hospital	Gen	Part	12	7	4	86	28
Glenwood, 2,220—Pope							
Glenwood Community Hosp. Gen	City	City	26	...	5	Estab. 190	
Graceville, 969—Big Stone							
West Central Minnesota Hospital	Gen	NPAasn	29	20	5	154	92
Grand Rapids, 3,206—Itasca							
Itasca Hospital	Gen	County	50	41	15	317	1,22
Granite Falls, 1,791—Yellow Medicine							
Granite Falls Hospital.....	Gen	Indiv	16	8	5	57	24
Riverside Sanatorium	TB	County	54	45	..	...	2
Hallok, 869—Kittson							
Kittson War Veterans' Memorial Hospital	Gen	NPAasn	32	21	8	191	60
Hendricks, 702—Lincoln							
Hendricks Hospital	Gen	NPAasn	14	9	4	23	20
Heron Lake, 756—Jackson							
Southwestern Minnesota Hospital	Gen	Indiv	12	4	2	29	112
Hibbing, 15,006—St. Louis							
Adams Hospital	Gen	Indiv	25	9	6	94	42
Rood Hospital	Gen	Indiv	50	17	19	166	104
Hutchinson, 3,466—McLeod							
Hutchinson Community Hospital	Gen	NPAasn	27	16	11	115	72
International Falls, 5,606—Koochiching							
Northern Minnesota Hosp... Gen	Corp	Corp	50	...	...	...	...
Jackson, 2,206—Jackson							
Halloran Hospital	Gen	Part	18	7	2	53	27

Key to symbols and abbreviations is on page 1195

MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Lake City, 3,210—Wabasha Lake City Hospital.....	Gen	NPAssn	32	18	9	82	548
Lake Park, 624—Becker Sand Beach Sanatorium....	TB	Counties	46	41	..	...	19
Litchfield, 2,880—Meeker Litchfield Hospital.....	Gen	Corp	29	17	6	112	868
Little Falls, 5,014—Morrison St. Gabriel's Hospital.....	Gen	Church	48	28	9	184	1,542
Littlefork, 474—Koochiching Littlefork Hospital.....	Gen	Indiv	8	8	4	78	400
Luverne, 2,644—Rock Luverne Hospital.....	Gen	NPAssn	15	5	6	101	391
Madison, 1,916—Lac qui Parle Ebenezer Lutheran Hospital	Gen	Church	20	10	5	52	322
Mankato, 14,038—Blue Earth Immanuel Hospital.....	Gen	Church	75	46	15	281	1,501
St. Joseph's Hospital.....	Gen	Church	125	49	18	352	1,930
Marshall, 3,250—Lyon Marshall Hospital.....	Gen	NPAssn	35	9	5	25	301
Melrose, 1,801—Stearns Melrose Hospital.....	Gen	Indiv	14	8	4	40	344
Minneapolis, 464,356—Hennepin Abbott Hospital.....	Gen	Church	140	101	22	380	4,344
Asbury Hospital.....	Gen	Church	122	87	18	417	4,130
Etzel Hospital.....	Gen	NPAssn	130	101	18	418	5,243
Elliot Memorial Hospital... Unit of University Hospitals	Gen	Church	200	100	28	551	5,217
Fairview Hospital.....	Gen	Church	200	100	28	551	5,217
George Chase Christian Memorial Cancer Institute... Unit of University Hospitals	Gen	Church	50	35	35	139	158
Harriet Walker Hospital... Mat	NPAssn	NPAssn	50	35	35	139	158
Lutheran Deaconess Home and Hospital.....	Gen	Church	150	110	20	586	4,490
Maternity Hospital.....	Mat	NPAssn	36	26	36	769	886
Minneapolis General Hospital.....	Gen	City	616	487	55	1,461	11,994
Minnesota General Hospital See University Hospitals	Gen	City	616	487	55	1,461	11,994
Northwestern Hospital.....	Gen	NPAssn	163	158	20	575	8,073
Ripley Memorial Hospital... Unit of Maternity Hospital	Gen	Church	80	53	20	255	1,922
St. Andrew's Hospital.....	Gen	Church	80	53	20	255	1,922
St. Barnabas Hospital.....	Gen	NPAssn	135	102	23	758	6,691
St. Mary's Hospital.....	Gen	Church	220	190	35	849	5,807
Shriners Hospital for Crippled Children.....	Orth	Frat	60	61	..	...	163
Swedish Hospital.....	Gen	NPAssn	233	206	42	1,061	7,401
Todd Memorial Eye, Ear, Nose and Throat Hospital... Unit of University Hospitals	Gen	State	475	368	25	489	9,530
University Hospitals.....	Gen	State	475	368	25	489	9,530
Veterans Admin. Facility... GenTb Vet	GenTb Vet	GenTb Vet	644	589	..	...	4,147
William Henry Eustis Children's Hospital..... Unit of University Hospitals	Gen	State	644	589	..	...	4,147
Montevideo, 4,319—Chippewa Montevideo Hospital.....	Gen	NPAssn	50	37	10	212	1,637
Moorhead, 7,631—Clay St. Angels Hospital.....	Gen	Church	50	28	10	163	811
Moore Lake, 742—Carlton Moose Lake Community Hospital.....	Gen	Indiv	12	4	3	63	208
Moose Lake State Hospital... Ment	State	State	1,000	592	..	...	687
Morris, 2,474—Stevens Morris Hospital.....	Gen	Indiv	14	7	4	48	296
Mountain Lake, 1,388—Cottonwood Bethel Hospital.....	Gen	Church	23	9	8	107	397
Clinic Hospital.....	Gen	Part	30	14	..	...	512
New Prague, 1,543—Le Sueur New Prague Community Hospital.....	Gen	NPAssn	21	9	3	75	403
New Ulm, 7,308—Brown Loretto Hospital.....	Gen	Church	45	28	8	169	1,105
Union Hospital.....	Gen	NPAssn	62	42	9	141	1,196
Nopeming, 384—St. Louis Nopeming Sanatorium.....	TB	County	235	217	..	...	142
Northfield, 4,153—Rice Northfield City Hospital....	Gen	City	13	8	5	60	296
Oak Terrace, 50—Hennepin Glen Lake Sanatorium.....	TB	County	700	631	6	2	482
Ortonville, 2,017—Big Stone Ortonville Evangelical Hosp. Gen	Gen	Church	20	7	4	56	270
Owatonna, 7,634—Steele Owatonna City Hospital... Gen	Gen	City	50	25	10	173	1,315
Paynesville, 1,121—Stearns Paynesville Hospital.....	Gen	Indiv	15	6	3	...	105
Perham, 1,411—Otter Tail St. James' Hospital.....	Gen	Church	40	17	6	123	780
Pine City, 1,345—Pine Lakeside Memorial Hospital	Gen	Indiv	20	10	4	64	439
Pine River, 422—Cass Pine River Hospital.....	Gen	Indiv	20	10	5	48	307
Pipestone, 3,489—Pipestone Ashten Memorial Hospital.. Gen	Gen	CyCo	50	30	8	162	1,147
Pokegama, 59—Pine Pokegama Sanatorium.....	GenTb	NPAssn	47	20	3	16	163
Princeton, 1,636—Mille Lacs Northwestern Hospital.....	Gen	Indiv	30	10	4	40	415
Puppsy, 63—Beltrami Lake Julia Tuberculosis Sanatorium.....	TB	Counties	57	55	..	...	73

MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Redlake, 214—Beltrami Redlake Indian Hospital....	Gen	IA	27	15	6	85	622
Red Wing, 9,629—Goodhue Red Wing Hospital.....	Gen	City	40	27	6	80	849
St. John's Hospital.....	Gen	NPAssn	75	46	15	271	2,104
Redwood Falls, 2,532—Redwood Redwood Falls Hospital....	Gen	Part	15	7	4	52	691
Richmond, 603—Stearns Richmond Hospital.....	Gen	NPAssn	10	4	3	37	320
Colonial Hospital.....	Gen	Corp	250	229	..	...	7,578
Kahler Hospital.....	Gen	Corp	129	91	..	...	3,487
Rochester State Hospital.....	Ment	State	1,490	1,489	..	...	625
St. Mary's Hospital.....	Gen	Church	586	502	27	568	12,216
Worral Hospital.....	SKCaEXT	Corp	188	133	..	...	7,932
Roseau, 1,023—Roseau Budd Hospital.....	Gen	NPAssn	24	9	4	53	377
St. Cloud, 21,000—Stearns St. Cloud Hospital.....	Gen	Church	210	146	21	592	3,821
St. James Admin. Facility... Ment	Ment	Vet	1,046	993	..	...	345
St. James, 2,808—Watsonwan St. James Hospital.....	Gen	Church	25	17	8	102	463
St. Paul, 271,606—Ramsey Ancker Hospital.....	Gen	CyCo	850	636	56	1,120	10,169
Bethesda Hospital.....	Gen	Church	120	106	25	841	4,681
Charles T. Miller Hosp.....	Gen	NPAssn	200	181	30	723	6,414
Children's Hospital.....	Chil	NPAssn	65	30	..	...	1,524
Gillette State Hospital for Crippled Children.....	Orth	State	250	220	..	...	643
Midway Hospital.....	Gen	Church	100	79	25	569	3,049
Mounds Park Hospital.....	Gen	Church	122	94	12	207	2,001
Northern Pacific Beneficial Association Hospital.....	Gen	NPAssn	139	84	11	114	2,647
Ramsey County Tuberculosis Pavilion..... Unit of Ancker Hospital	Gen	Church	75	45	15	223	1,974
St. John's Hospital.....	Gen	Church	250	196	32	714	8,229
St. Joseph's Hospital.....	Gen	NPAssn	150	...	No data supplied	...	...
St. Luke's Hospital.....	Gen	Church	55	36	15	241	1,426
West Side General Hospital	Gen	City	30	...	12	Estab. 1939	...
St. Peter, 4,811—Nicollet Community Hospital.....	Gen	City	20	...	12	Estab. 1939	...
St. Peter State Hosp.....	Ment	State	2,283	2,179	..	...	598
Shakopee, 2,023—Sent St. Francis Hospital.....	Gen	Church	10	...	4	Estab. 1939	...
Shakopee Hospital.....	Gen	Indiv	17	9	6	25	257
Slayton, 1,102—Murray Home Hospital.....	Gen	Part	28	14	6	91	613
Springfield, 2,049—Brown St. John's Hospital.....	Gen	Church	19	14	5	116	589
Spring Grove, 807—Houston Spring Grove Hospital.....	Gen	Corp	14	6	7	92	366
Staples, 2,667—Todd Municipal Hospital.....	Gen	City	22	6	5	85	367
Starbuck, 781—Pope Minniewaska Hospital.....	Gen	NPAssn	15	10	4	81	357
Stillwater, 7,173—Washington Lakeview Memorial Hosp.....	Gen	CyCo	40	25	8	150	1,300
Thief River Falls, 4,268—Pennington Mercy Hospital.....	Gen	NPAssn	23	16	6	182	623
Oakland Park Sanatorium... TB	Counties	Counties	65	55	..	...	28
St. Luke's Hospital.....	Gen	NPAssn	41	22	6	76	862
Tracy, 2,570—Lyon Clinic Hospital.....	Gen	Part	14	6	5	42	261
Two Harbors, 4,425—Lake Two Harbors Hospital.....	Gen	Part	32	17	6	91	611
Tyler, 905—Lincoln Tyler Hospital.....	Gen	NPAssn	21	14	7	128	766
Virginia, 11,963—St. Louis Virginia Municipal Hosp... Gen	Gen	City	100	38	25	263	1,714
Wabasha, 2,212—Wabasha Buena Vista Sanatorium....	TB	Counties	20	27	..	...	22
St. Elizabeth's Hospital.....	Gen	Church	65	23	9	71	625
Waconia, 1,291—Carver Nagel Hospital.....	Gen	Indiv	10	6	3	19	221
Wadena, 2,512—Wadena Fair Oaks Lodge Sanat.....	TB	Counties	36	27	..	...	27
Wesley Hospital.....	Gen	Church	43	26	10	172	1,101
Walker, 618—Cass Walker Hospital.....	Gen	Indiv	20	4	4	39	169
Warren, 1,472—Marshall Warren Hospital.....	Gen	Church	30	12	6	82	522
Warroad, 1,184—Roseau Warroad Hospital.....	Gen	City	17	8	6	43	249
Waseca, 3,815—Waseca Waseca Memorial Hospital.. Gen	Gen	City	25	14	8	208	989
White Earth, 415—Becker White Earth Indian Hosp... Gen	Gen	IA	20	19	8	153	765
Willmar, 6,173—Kandiyohi Willmar Hospital.....	Gen	Corp	35	16	5	54	502
Windom, 2,123—Cottonwood Windom Hospital.....	Gen	NPAssn	15	7	5	63	313
Winnebago, 1,701—Faribault Winnebago Community Hospital.....	Gen	Part	12	6	4	51	252
Winona, 20,850—Winona Winona General Hospital.. Gen	Gen	NPAssn	112	60	17	397	3,077
Worthington, 3,878—Nobles Northwestern Minnesota Sanatorium.....	TB	Counties	54	37	..	...	44
Worthington Clinic Hosp... Gen	Part	Part	25	19	8	162	762

Key to symbols and abbreviations is on page 1195

MINNESOTA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Anoka, 4,531—Anoka							
Anoka State Hospital	Ment	State	1,490 ¹	1,432	..	...	110
Barrett, 368—Grant							
Powers Hospital	Surg	Indiv	10	1	..	...	61
Bertha, 490—Todd							
Thiel Hospital	Gen	Indiv	20	6	8	91	308
Braham, 579—Isanti							
Braham Hospital	Gen	Indiv	12	...	4	Reopened	
Buhl, 1,634—St. Louis							
Range Hospital	Gen	County	46	34	..	...	729
Caledonia, 1,531—Houston							
Caledonia Hospital	Gen	Indiv	15	8	8	60	257
Cambridge, 1,183—Isanti							
Minnesota Colony for Epileptics	MeDe	State	1,105 ¹	1,097	..	...	45
Cokato, 1,123—Wright							
Cokato Hospital	Gen	Indiv	12	6	6	42	255
Duluth, 101,463—St. Louis							
Hearding Hospital	Inst	County	65	64	..	...	1,866
Ellsworth, 644—Nobles							
Ellsworth Hospital	Gen	Indiv	10	2	3	19	79
Ely, 6,156—St. Louis							
Detention Hospital	Iso	City	19	3	..	...	61
Faribault, 12,767—Rice							
Minnesota School for Feeble-minded	MeDe	State	2,550 ¹	2,458	16	29	318
Greenbush, 357—Roseau							
General Hospital	Gen	Indiv	9	6	3	80	282
Hastings, 5,086—Dakota							
Hastings State Hospital	Ment	State	1,188 ¹	1,071	..	...	76
Latto Hospital	Gen	Indiv	20	...	No data supplied		
St. Francis Hospital	Gen	Part	18	10	3	31	275
Hibbing, 15,666—St. Louis							
Hibbing Detention Hospital	Iso	City	25	2	..	...	23
Long Prairie, 1,854—Todd							
Long Prairie Hospital	Gen	Part	15	6	3	18	203
Madelia, 1,397—Watsonwan							
Madelia Hospital	Gen	Indiv	13	5	4	69	246
Minneapolis, 464,356—Hennepin							
Franklin Hospital	ChrConv	NPAasn	60	51	..	...	556
Glenwood Hills Hospitals	N&M	NPAasn	46	30	..	...	239
Homewood Hospital	Unit of Glenwood Hills Hospitals						
Lymnaburgh Health Center	Chil	City	40	40	..	...	55
Minneapolis Sanitarium	N&M	Indiv	24	23	..	...	46
Minnesota Soldiers' Home							
Hospital	Inst	State	85	60	..	...	378
Parkview Sanatorium	Chr	City	177	146	..	...	141
Portland Resthome	N&M	Indiv	10	3	..	...	3
Rest Hospital	N&M	Part	18	18	..	...	147
Vocational Nursing Home	Conv	NPAasn	41	37	..	...	111
Women's Welfare League							
Home for Convalecents	Conv	NPAasn	25	18	..	...	83
Morris, 2,474—Stevens							
Stevens County Hospital	Gen	NPAasn	23	12	6	62	404
Nicollet, 434—Nicollet							
Nicollet Hospital	Gen	Indiv	8	2	3	19	94
Owatonna, 7,654—Steele							
Minnesota State Public School Hospital	Inst	State	60	24	..	...	964
Pelican Rapids, 1,365—Otter Tail							
Dr. Boyens's Hospital	Gen	Indiv	10	2	4	25	71
Pelican Rapids Hospital	Gen	Indiv	7	3	3	58	117
Pipestone, 3,489—Pipestone							
Pipestone Indian Hospital	Gen	IA	26	28	4	13	374
Red Wing, 9,629—Goodhue							
Minnesota State Training School for Boys	Inst	State	30	20	..	...	1,634
St. Cloud, 21,000—Stearns							
Minnesota State Reformatory Hospital	Inst	State	55	35	..	...	659
St. Paul, 271,605—Ramsey							
Children's Preventorium of Ramsey County	TB	CyCo	80	72	..	...	92
Mrs. Robbins Rest Home	N&M	Indiv	12	8	..	...	...
Salvation Army Booth Memorial Hospital	Mat	Church	75	49	11	122	147
Samaritan Hospital	Gen	NPAasn	26	10	7	106	492
Sauk Centre, 2,716—Stearns							
Home School for Girls (Higbee Hospital)	Inst	State	10	4	5	11	167
Long Hospital	Gen	Indiv	8	3	5	15	80
Shakopee, 2,023—Scott							
Mudeura Sanitarium	Conv	Corp	75	42	..	...	1,976
Stillwater, 5,173—Washington							
Minnesota State Prison Hospital	Inst	State	65	27	..	...	850
Wyata, 1,100—Hennepin							
Minnetonka Hospital	Gen	NPAasn	15	6	3	26	113
Wheaton, 1,273—Traverse							
Wheaton Hospital	Gen	Indiv	10	4	5	22	179
Willmar, 6,173—Kandiyohi							
Willmar State Hospital	Ment	State	1,450 ¹	1,424	..	...	273

MISSISSIPPI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Aberdeen, 3,023—Monroe							
Aberdeen Hospital	Gen	NPAasn	20	5	4	26	25
Amory, 3,214—Monroe							
Gilmore Sanitarium	Gen	NPAasn	35	16	8	22	61
Biloxi, 14,850—Harrison							
Biloxi Hospital	Gen	NPAasn	30	23	9	121	185
Veterans Admin. Facility	Gen	Vet	207	183	...	...	159
Booneville, 1,703—Prentiss							
North East Mississippi Hospital	Gen	NPAasn	40	18	2	42	53
Brookhaven, 5,288—Lincoln							
Kings Daughters Hospital	Gen	NPAasn	35	19	7	79	81
Canton, 4,725—Madison							
Kings Daughters Hospital	Gen	NPAasn	21	12	5	20	42
Centerville, 1,344—Wilkinson							
Field Memorial Hospital	Gen	Part	28	16	4	61	61
Charleston, 2,014—Tallahatchie							
Tallahatchie Hospital	Gen	Indiv	15	12	2	20	43
Clarksdale, 10,048—Coahoma							
Clarksdale Hospital	Gen	NPAasn	31	5	10	81	58
Cleveland, 3,240—Bolivar							
City Hospital	Gen	City	22	10	4	52	44
Columbia, 4,833—Marion							
Columbia Clinic Hospital	Gen	NPAasn	37	21	4	29	165
Columbus, 10,743—Lowndes							
Columbus Hospital	Gen	Indiv	18	5	5	40	21
Doster Hospital	Gen	Indiv	35	15	6	24	23
Corinth, 6,220—Alcorn							
Corinth Hospital	Gen	Indiv	14	6	3	47	26
McRae Hospital	Gen	NPAasn	50	15	4	34	54
Electric Mills, 1,084—Kemper							
George C. Hixon Memorial Hospital	Gen	NPAasn	30	14	4	82	70
Greenville, 14,807—Washington							
Kings Daughters Hospital	Gen	NPAasn	100	54	14	181	228
Greenwood, 11,123—Leflore							
Greenwood-Leflore Hospital	Gen	CyCo	55	28	8	137	152
Victoria Butler Hospital	Gen	Indiv	20	...	...	Destroyed by fire	
Grenada, 4,340—Grenada							
Grenada General Hospital	Gen	Part	50	20	5	47	124
Gulfport, 12,517—Harrison							
Kings Daughters Hospital	Gen	NPAasn	50	28	6	218	105
Veterans Admin. Facility	Ment	Vet	788	794	...	...	...
Hattiesburg, 18,691—Forrest							
Methodist Hospital	Gen	Church	75	36	12	251	260
South Mississippi Infirmary	Gen	Indiv	60	17	15	23	71
Houston, 1,477—Chickasaw							
Houston Hospital	Gen	NPAasn	35	18	3	21	94
Jackson, 45,282—Hinds							
Jackson Infirmary	Gen	NPAasn	68	40	12	265	243
Mississippi Baptist Hosp.	Gen	Church	155	99	20	418	524
Mississippi State Charity Hospital	Gen	State	72	50	10	76	124
Welch's Sanitarium	N&M	Indiv	22	8	...	...	16
Dr. Willis Walley Hospital	Gen	Indiv	70	9	5	50	60
Kosciusko, 3,237—Attala							
Montfort Jones Hospital	Gen	CyCo	24	8	2	37	68
Lambert, 800—Quitman							
Lambert Hospital	Gen	Indiv	14	3	4	75	50
Laurel, 18,017—Jones							
Laurel General Hospital	Gen	Indiv	50	20	6	234	1,752
South Mississippi Charity Hospital	Gen	State	73	50	6	127	2,201
Lexington, 2,590—Holmes							
Holmes County Community Hospital	Gen	County	25	11	2	30	65
Lumberton, 2,374—Lamar							
City Hospital	Gen	Indiv	20	8	4	69	50
Macon, 2,198—Noxubee							
Macon Hospital	Gen	Indiv	25	11	4	62	59
Marks, 1,258—Quitman							
Marks Hospital	Gen	Indiv	20	2	3	102	57
McComb, 10,057—Pike							
McComb City Hospital	Gen	Part	27	14	4	67	1,227
McComb Infirmary	Gen	NPAasn	20	11	4	60	84
Meridian, 31,954—Lauderdale							
Anderson Infirmary	Gen	Indiv	45	11	5	62	69
East Mississippi State Hosp.	Ment	State	850 ¹	767	...	...	19
Hope's Sanitarium	N&M	Indiv	26	12	...	...	2,124
Matty Hersee Hospital	Gen	State	65	59	5	81	1,212
Meridian Sanitarium	Gen	Indiv	65	24	15	121	1,612
Riley's Hospital and Clinic	Gen	Indiv	25	8	4	29	63
Rush's Infirmary	Gen	NPAasn	50	31	6	73	1,760
Morton, 855—Scott							
Scott County Hospital	Gen	Part	16	9	2	59	55
Natchez, 13,422—Adams							
Natchez Charity Hospital	Gen	State	75	50	8	258	2,115
Natchez Sanatorium	Gen	Corp	50	17	5	10	121
New Albany, 3,157—Union							
Mayes Hospital	Gen	NPAasn	32	6	3	65	211
New Albany Hospital and Clinic	Gen	NPAasn	10	6	2	31	57
Newton, 2,011—Newton							
Newton Infirmary	Gen	NPAasn	25	9	4	51	61

Key to symbols and abbreviations is on page 1195

MISSISSIPPI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Oxford, 2,890—Lafayette	Gen	Corp	35	20	6	45	1,035
Bramlett Hospital	Gen	Indiv	30	24	5	97	1,506
Oxford Hospital	Gen	Indiv	30	24	5	97	1,506
Pascagoula, 4,339—Jackson	Gen	County	25	13	4	59	582
Jackson County Hospital	Gen	County	25	13	4	59	582
Philadelphia, 2,560—Neshoba	Gen	County	25	13	4	59	582
Choctaw-Mississippi Indian Hospital	Gen	IA	28	22	7	43	795
Philadelphia Hospital	Gen	NPAasn	28	24	8	53	792
Pleayune, 4,098—Pearl River	Gen	Indiv	24	4	2	28	252
Martin Sanatorium	Gen	Indiv	24	4	2	28	252
Poplarville, 1,498—Pearl River	Gen	County	26	6	2	8	412
Poplarville Hospital	Gen	County	26	6	2	8	412
Sanatorium, 200—Simpson	Gen	County	26	6	2	8	412
Mississippi State Tuberculosis Sanatorium	Gen	State	425	281	..	..	414
Starkville, 3,612—Oktibbeha	Gen	Indiv	21	8	2	33	374
Oktibbeha Hospital	Gen	Indiv	21	8	2	33	374
Tupelo, 6,361—Lee	Gen	NPAasn	49	26	10	113	1,276
North Mississippi Community Hospital	Gen	NPAasn	49	26	10	113	1,276
Tylertown, 1,102—Walthall	Gen	NPAasn	15	7	2	37	602
Tylertown Hospital	Gen	NPAasn	15	7	2	37	602
Walthall Hospital	Gen	NPAasn	20	7	4	64	477
Vicksburg, 22,943—Warren	Gen	State	60	62	7	336	2,760
Mississippi State Charity Hospital	Gen	State	60	62	7	336	2,760
Vicksburg Hospital	Gen	NPAasn	50	31	6	81	1,634
Vicksburg Infirmary	Gen	NPAasn	50	40	4	36	1,670
Vicksburg Sanitarium	Gen	NPAasn	75	55	10	111	2,298
Water Valley, 3,738—Yalobusha	Gen	Part	25	10	4	20	574
Water Valley Hospital	Gen	Part	25	10	4	20	574
West Point, 4,677—Clay	Gen	Indiv	25	12	4	37	437
Ivy Hospital	Gen	Indiv	25	12	4	37	437
Whitfield, —Rankin	Gen	State	3,500†	3,220	..	15	1,922
Mississippi State Hospital	Gen	State	3,500†	3,220	..	15	1,922
Winona, 2,607—Montgomery	Gen	NPAasn	30	12	2	37	523
Winona Infirmary	Gen	NPAasn	30	12	2	37	523
Yazoo City, 5,579—Yazoo	Gen	NPAasn	30	9	3	39	706
Kings Daughters Hospital	Gen	NPAasn	30	9	3	39	706
Related Institutions							
Baldwyn, 1,106—Lee	Gen	Indiv	10	5	1	22	196
Baldwyn Hospital	Gen	Indiv	10	5	1	22	196
Bay St. Louis, 3,724—Hancock	Gen	NPAasn	9	6	6	80	625
Kings Daughters and Sons Hospital	Gen	NPAasn	9	6	6	80	625
Biloxi, 14,850—Harrison	Gen	State	60	28	..	..	14
Jefferson Davis Soldiers Home (Beauvoir Hospital)	Gen	State	60	28	..	..	14
Brandon, 692—Rankin	Gen	Indiv	25	15	2	50	456
Holyfield Hospital (Brandon Clinic)	Gen	Indiv	25	15	2	50	456
Columbia, 4,833—Marion	Gen	Indiv	12	5	5	21	175
Applewhite Hospital	Gen	Indiv	12	5	5	21	175
Ellisville, 2,127—Jones	Gen	State	400†	..	No data supplied	..	15
Ellisville State School	Gen	State	400†	..	No data supplied	..	15
Jones County Cottage Sanatorium	Gen	County	20	17	..	..	15
Greenville, 14,807—Washington	Gen	Indiv	50	38	2	25	750
Colored Kings Daughters Hospital	Gen	Indiv	50	38	2	25	750
Greenwood, 11,123—Leflore	Gen	Part	15	8	1	5	297
Greenwood Colored Hospital	Gen	Part	15	8	1	5	297
Magee, 964—Simpson	Gen	Corp	28	13	3	48	706
Magee General Hospital	Gen	Corp	28	13	3	48	706
Meridian, 31,954—Lauderdale	Gen	NPAasn	45	20	..	..	26
Kings Daughters Tuberculosis Hospital	Gen	NPAasn	45	20	..	..	26
Lewis Hospital	Gen	Indiv	12	6	4	22	348
Okolona, 2,235—Chickasaw	Gen	Indiv	15	8	2	40	250
City Hospital	Gen	Indiv	15	8	2	40	250
Pontotoc, 2,018—Pontotoc	Gen	Part	10	5	2	26	275
Pontotoc Clinic	Gen	Part	10	5	2	26	275
Raymond, 547—Hinds	Gen	County	30	30	..	..	42
Hinds County Tuberculosis Hospital	Gen	County	30	30	..	..	42
Rosedale, 2,117—Holtz	Gen	Indiv	16	13	..	2	610
Dr. Nobles' Clinic	Gen	Indiv	16	13	..	2	610
Rosedale - Holtz County Hospital	Gen	City	18	6	3	15	350
Shelby, 1,811—Holtz	Gen	NPAasn	9	2	2	11	88
Hall Hospital	Gen	NPAasn	9	2	2	11	88
State College, 220—Oktibbeha	Gen	State	44	3	..	..	124
James Z. George Memorial Hospital	Gen	State	44	3	..	..	124
University, 15—Lafayette	Gen	State	30	..	No data supplied	..	..
University of Mississippi Hospital	Gen	State	30	..	No data supplied	..	..
Waynesboro, 1,120—Wayne	Gen	Indiv	13	..	No data supplied	..	..
Waynesboro Clinic	Gen	Indiv	13	..	No data supplied	..	..

MISSOURI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Bonne Terre, 4,021—St. Francois	Gen	NPAasn	31	15	5	90	625
Bonne Terre Hospital	Gen	NPAasn	31	15	5	90	625
Boonville, 6,435—Cooper	Gen	Church	75	36	14	121	1,011
St. Joseph's Hospital	Gen	Church	75	36	14	121	1,011
Butler, 2,706—Bates	Gen	Indiv	20	6	4	85	600
Butler Memorial Hospital	Gen	Indiv	20	6	4	85	600
California, 2,384—Monteau	Gen	Indiv	33	15	2	..	1,147
Latham Sanitarium	Gen	Indiv	33	15	2	..	1,147
Canton, 2,044—Lewis	Gen	NPAasn	12	5	3	22	250
Canton Community Hosp.	Gen	NPAasn	12	5	3	22	250
Cape Girardeau, 16,227—Cape Girardeau	Gen	Church	100	53	15	273	2,315
St. Francis Hospital	Gen	Church	100	53	15	273	2,315
Southeast Missouri Hosp.	Gen	NPAasn	65	41	14	171	1,746
Carthage, 9,736—Jasper	Gen	City	44	20	6	134	1,049
McCune-Brooks Hospital	Gen	City	44	20	6	134	1,049
Cassville, 1,016—Barry	Gen	Indiv	10	5	4	40	302
Barry County Hospital and Clinic	Gen	Indiv	10	5	4	40	302
Clayton, 9,613—St. Louis	Gen	County	175	146	35	493	4,463
St. Louis County Hosp.	Gen	County	175	146	35	493	4,463
Columbia, 14,667—Boone	Gen	County	48	22	4	86	1,046
Boone County General Hospital	Gen	County	48	22	4	86	1,046
Noyes Hospital	Gen	Unit of University Hospitals	..	..	..	..	..
Parker Memorial Hospital	Gen	Unit of University Hospitals	..	..	..	..	..
State Hospital for Crippled Children	Gen	Unit of University Hospitals	..	..	..	..	..
University Hospitals	Gen	State	150	66	10	63	3,393
Excelsior Springs, 4,565—Clay	Gen	Corp	40	9	4	27	310
Excelsior Springs Sanitarium and Hospital	Gen	Corp	40	9	4	27	310
Veterans Admin. Facility	Gen	Vet	252	187	..	..	1,612
Farmington, 3,001—St. Francois	Gen	State	1,600†	1,506	..	..	695
State Hospital No. 4	Gen	State	1,600†	1,506	..	..	695
Fayette, 2,630—Howard	Gen	Part	20	12	3	19	412
Lee Hospital	Gen	Part	20	12	3	19	412
Fulton, 6,105—Callaway	Gen	State	2,728†	2,318	..	..	600
State Hospital No. 1	Gen	State	2,728†	2,318	..	..	600
Hannibal, 22,761—Marion	Gen	City	90	44	15	189	2,115
Levering Hospital	Gen	City	90	44	15	189	2,115
St. Elizabeth's Hospital	Gen	Church	86	47	15	212	1,815
Independence, 15,296—Jackson	Gen	Church	68	43	12	303	1,622
Independence Sanitarium and Hospital	Gen	Church	68	43	12	303	1,622
Ironton, 974—Iron	Gen	Church	31	24	5	62	573
Arcadia Valley Hospital, St. Mary's of the Ozarks	Gen	Church	31	24	5	62	573
Jefferson Barracks (St. Louis P.O.), 842—St. Louis	Gen	Army	177	121	6	28	1,761
Station Hospital	Gen	Army	177	121	6	28	1,761
Veterans Admin. Facility	Gen	Vet	511	372	..	..	2,845
Jefferson City, 21,596—Cole	Gen	Church	100	67	15	257	2,345
St. Mary's Hospital	Gen	Church	100	67	15	257	2,345
Joplin, 33,454—Jasper	Gen	Church	87	39	12	140	1,522
Freeman Hospital	Gen	Church	87	39	12	140	1,522
St. John's Hospital	Gen	Church	110	63	10	217	2,343
Kansas City, 399,746—Jackson	Gen	NPAasn	145	129	..	..	2,905
Children's Mercy Hosp.	Gen	NPAasn	145	129	..	..	2,905
Fairmount Maternity Hosp.	Gen	Corp	50	36	24	185	160
Kansas City General Hospital	Gen	City	500	423	40	1,079	12,067
Kansas City General Hospital No. 2	Gen	City	250	177	24	450	3,651
Kansas City Municipal Tuberculosis Hospital	Gen	City	276	191	..	..	252
Major Clinic	Gen	Indiv	35	20	..	..	115
Menorah Hospital	Gen	NPAasn	150	107	23	315	3,701
Neurological Hospital	Gen	NPAasn	49	28	..	..	283
Ralph Sanitarium	Gen	Indiv	20	9	..	..	170
Research Hospital	Gen	NPAasn	200	100	25	485	5,163
St. Joseph Hospital	Gen	Church	222	174	36	868	6,187
St. Luke's Hospital	Gen	Church	235	166	26	516	5,135
St. Mary's Hospital	Gen	Church	175	126	25	541	4,393
St. Vincent's Maternity Hospital	Gen	Church	42	15	35	348	408
Trinity Lutheran Hosp.	Gen	Church	112	67	24	372	3,142
Vineyard Park Hospital	Gen	Indiv	30	24	..	4	862
Wesley Hospital	Gen	Church	50	19	10	56	618
Wheatley-Provident Hosp.	Gen	NPAasn	67	29	2	33	706
Willows Maternity Sanit.	Gen	Indiv	75	30	75	129	149
Kirksville, 8,293—Adair	Gen	Corp	34	27	6	44	1,051
Grim-Smith Hospital and Clinic	Gen	Corp	34	27	6	44	1,051
Stickler Hospital	Gen	Corp	25	10	5	33	403
Kirkwood, 9,169—St. Louis	Gen	Corp	12	9	..	..	21
Oakland Park Hospital	Gen	Corp	12	9	..	..	21
U. S. Marine Hospital	Gen	USPHS	144	100	..	..	1,290
Lamar, 2,381—Barton	Gen	Indiv	9	4	3	101	267
Bickel Hospital	Gen	Indiv	9	4	3	101	267
Lebanon, 3,562—Laclede	Gen	NPAasn	24	25	5	59	1,450
Louise G. Wallace Hospital	Gen	NPAasn	24	25	5	59	1,450
Louisiana, 3,549—Pike	Gen	County	64	20	11	70	714
Pike County Hospital	Gen	County	64	20	11	70	714
Marcelline, 3,553—Linn	Gen	Indiv	12	4	3	20	200
B. B. Putman Memorial Hospital	Gen	Indiv	12	4	3	20	200

Key to symbols and abbreviations is on page 1195

MISSOURI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Marshall, 8,103—Saline Georgia Brown Blosser Home for Crippled Children.....	Orth	NPAasn	60	31	..	...	217
John Fitzgibbon Memorial Hospital	Gen	NPAasn	45	12	5	70	640
Maryville, 5,217—Nodaway St. Francis Hospital.....	Gen	Church	75	35	12	191	1,358
Mexico, 8,200—Audrain Audrain Hospital	Gen	County	50	26	7	125	1,112
Moberly, 13,772—Randolph McCormick Hospital	Gen	Indiv	35	14	5	37	544
Wabash Employees' Hosp. A. Indus	NPAasn	Corp	35	13	..	...	296
Woodland Hospital	Gen	Corp	35	20	5	54	728
Monett, 4,029—Barry Dr. William M. West's Hosp. Gen	Indiv		18	5	3	18	200
Mt. Vernon, 1,342—Lawrence Missouri State Sanatorium TB	State		740	686	..	...	848
Neosho, 4,455—Newton Sale-Bowman Hospital	Gen	Part	26	6	6	102	682
Nevada, 7,448—Vernon Nevada Hospital	Gen	City	27	12	6	65	498
State Hospital No. 3A.....	Ment	State	1,900†	1,844	..	...	553
Pine Lawn (St. Louis P.O.), —St. Louis Thernon Hospital and Clinic Gen	Indiv		29	12	4	12	125
Poplar Bluff, 7,551—Butler Brandon Hospital	Gen	Indiv	45	20	5	65	693
Lucy Leo Hospital	Gen	Indiv	62	44	12	80	950
Poplar Bluff Hospital.....	Gen	Indiv	56	38	10	49	900
Robertson, 500—St. Louis Jewish Sanatorium	TB	NPAasn	108	65	..	...	69
Rolla, 3,670—Phelps Missouri Trachoma Hospital Trach	State		65	28	..	...	312
Nelle McFarland Memorial Hospital	Gen	Indiv	46	21	10	41	722
St. Charles, 10,491—St. Charles St. Joseph's Hospital.....	Gen	Church	55	48	10	188	1,500
St. James, 1,294—Phelps St. James Hospital.....	Gen	Indiv	15	6	7	40	215
St. Joseph, 80,935—Buchanan Missouri Methodist Hosp. AAO Gen	Church		150	105	20	370	4,033
St. Joseph's Hospital AAO.....	Gen	Church	160	84	20	343	3,409
State Hospital No. 2+ A.....	Ment	State	2,900†	2,648	..	...	714
St. Louis, 821,900—St. Louis City Alexian Brothers Hospital AAO Gen	Church		165	95	..	...	1,276
Barnard Free Skin and Cancer Hospital AAO.....	SkCancer	NPAasn	44	39	..	...	985
Barnes Hospital AAO.....	Gen	Church	400	296	..	...	10,091
Bethesda General Hospital AAO Gen	NPAasn		100	60	20	233	1,634
Central Hospital	Gen	NPAasn	34	25	9	114	650
Christian Hospital AAO.....	Gen	NPAasn	90	51	25	319	1,715
City Isolation Hospital AAO.....	Thlso	City	225	121	..	...	1,283
City Sanitarium AAO.....	Ment	City	3,600	3,557	..	...	500
De Paul Hospital AAO.....	Gen	Church	250	185	35	966	7,429
Evangelical Deaconess Home and Hospital AAO.....	Gen	Church	174	146	35	730	6,078
Faith Hospital	Gen	NPAasn	35	11	6	40	391
Firmin Desloge Hospital AAO Gen	Church		223	107	28	699	4,767
Frisco Employees' Hospital AAO Indus	NPAasn		100	47	..	...	1,163
Hoimer G. Phillips Hosp. AAO Gen	City		684	534	57	1,330	9,748
Jewish Hospital AAO.....	Gen	NPAasn	250	160	33	478	6,658
Josephine Heltkamp Memorial Hospital AAO.....	Gen	Church	35	25	12	223	1,135
Lutheran Hospital AAO.....	Gen	Church	150	96	30	563	4,618
Missouri Baptist Hosp. AAO Gen	Church		400	214	30	401	5,465
Missouri Pacific Hospital AAO Indus	NPAasn		300	119	..	...	3,951
Mt. St. Rose Sanatorium AAO TB	Church		135	124	..	...	291
Peoples Hospital	Gen	NPAasn	60	24	5	51	775
Robert Koch Hospital AAO TB	City		547	528	..	...	250
St. Ann's Maternity Hosp. AAO Mat	Church		50	26	40	480	600
St. Anthony's Hospital AAO Gen	Church		200	135	50	1,051	4,651
St. John's Hospital AAO Gen	Church		226	220	34	683	6,530
St. Louis Children's Hospital AAO	Chll	NPAasn	195	121	..	...	3,352
St. Louis City Hospital AAO Gen	City		694	719	40	1,919	18,954
St. Louis Maternity Hos. pital AAO.....	Mat	NPAasn	98	60	98	1,822	2,161
St. Luke's Hospital AAO.....	Gen	Church	174	154	32	449	4,856
St. Mary's Hospital AAO.....	Gen	Church	315	250	20	570	6,102
St. Mary's Infirmary AAO.....	Gen	Church	129	64	20	163	1,546
St. Vincent's Sanitarium AAO N&M	Church		250	222	..	...	131
Shriners Hospital for Crippled Children AAO.....	Orth	Frat	100	101	..	...	417
Sedalia, 29,506—Pettis John H. Bothwell Memorial Hospital	Gen	City	60	29	16	149	1,006
Smithville, 902—Clay Smithville Community Hosp. Gen	NPAasn		15	7	3	31	293
Springfield, 57,527—Greene Burke Hospital AAO.....	Gen	Church	85	54	10	271	2,212
Medical Center for Federal Prisoners	Ment Tb	Fed	1,600	609	..	...	554
St. John's Hospital AAO.....	Gen	Church	109	67	14	312	2,462
Springfield Baptist Hosp. AAO Gen	NPAasn		80	42	10	147	1,553
Trenton, 6,022—Grundy Culbert Hospital	Gen	Indiv	14	7	2	15	237
Wright Memorial Hospital.....	Gen	NPAasn	17	6	4	25	372
Washington, 5,915—Franklin St. Francis Hospital.....	Gen	Church	40	22	19	133	843

MISSOURI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Webb City, 6,876—Jasper Jasper County Tuberculosis Hospital	TB	County	115	81	..	...	12
Webster Groves, 16,487—St. Louis Glenwood Sanatorium	N&M	Corp	76	40	..	...	95
West Plains, 3,335—Howell Christa Hogan Hospital.....	Gen	Indiv	18	7	1	17	25
Related Institutions							
Independence, 15,296—Jackson Valle Sanitarium	N&M	Corp	25	18	..	...	11
Jefferson City, 21,596—Cole Missouri State Penitentiary Hospital AAO.....	Inst	State	240	93	..	...	1,337
Kansas City, 399,746—Jackson Cresthaven Convalescent Home	Conv	Indiv	25	..	..	...	0
Florence Crittenton Home.....	Mat	NPAasn	23	19	8	21	41
Florence Home for Colored Girls	Mat	NPAasn	54	33	6	60	61
Trowbridge Training School for Nervous and Backward Children	MeDe	Indiv	25	20	..	...	21
Liberty, 3,516—Clay Missouri Odd Fellows Home Hospital	Inst	Frat	85	59	..	...	59
Marshall, 8,103—Saline Missouri State School—Epilepsy and Feeble-minded.....	MeDe	State	1,583†	1,483	..	...	187
Marthasville, 394—Warren Evangelical Emmaus Home for Epileptics and Feeble-minded	MeDe	Church	125	99	..	...	6
Mountain Grove, 2,229—Wright Ryan Hospital	Gen	Indiv	10	4	3	18	191
Rolla, 3,670—Phelps Missouri School of Mines Hospital	Inst	State	14	2	..	...	231
St. Charles, 10,491—St. Charles Evangelical Emmaus Home for Epileptics and Feeble-minded	MeDe	Church	146	139	..	...	13
St. James, 1,294—Phelps State Federal Soldiers Home Hospital	Inst	State	50	20	..	...	109
St. Louis, 821,900—St. Louis City Booth Memorial Hospital.....	Mat	Church	105	40	10	110	112
City Infirmary	Inst	City	95	85	..	...	29
Hospital of Masonic Home.....	Inst	Frat	123	68	..	...	56
Mother of Good Counsel Home and Hospital.....	Cancer	Church	85	40	..	...	82
Night and Day Camp for Children	Chll	NPAasn	80	65	..	...	12
St. Louis Training School.....	MeDe	City	490	475	..	...	27
Sedalia, 29,506—Pettis City Hospital No. 2.....	Gen	City	10	5	2	4	92
Springfield, 57,527—Greene City Hospital	Gen	City	25	9	2	61	60
Valley Park, 1,772—St. Louis Ridge Farm.....	Unit of St. Louis Children's Hospital						
Warrensburg, 5,146—Johnson Warrensburg Clinic	Gen	Part	10	1	1	4	81
West Plains, 3,335—Howell Cottage Hospital	Gen	Indiv	7	2	4	31	73

MONTANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Anaconda, 12,491—Deerlodge St. Ann's Hospital.....	Gen	Church	90	52	15	127	1,156
Billings, 16,580—Yellowstone Billings Deaconess Hosp. AAO Gen	Church		58	56	12	428	2,091
St. Vincent Hospital AAO.....	GenOr	Church	150	103	16	350	2,593
Bozeman, 6,855—Gallatin Bozeman Deaconess Hosp. AAO Gen	Church		64	39	12	258	1,290
Browning, 1,172—Glacier Blackfeet Hospital	Gen	IA	45	23	8	122	84
Butte, 29,532—Silver Bow Murray Hospital AAO.....	Corp		120	67	29	320	2,473
St. James Hospital AAO.....	Gen	Church	175	94	26	594	2,755
Choteau, 926—Teton Choteau Hospital	Gen	Indiv	20	7	4	57	355
Conrad, 1,429—Pondera St. Mary's Hospital.....	Gen	Church	53	27	10	95	541
Crow Agency, 539—Big Horn Crow Indian Hospital.....	Gen	IA	23	17	4	65	722
Deer Lodge, 3,519—Powell Montana State Tuberculosis Sanitarium	TB	State	215	211	..	...	121
St. Joseph Hospital.....	Gen	Church	59	25	6	71	609
Dillon, 2,422—Beaverhead Barrett Hospital	Gen	Corp	22	9	4	85	60

Key to symbols and abbreviations on page 1195

MONTANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Helena, 800—Lincoln	Gen	Indiv	12	3	5	16	85
Eureka Hospital	Gen	Indiv	12	3	5	16	85
St. Benton, 1,109—Chouteau	Gen	Church	48	20	6	72	504
St. Clare Hospital	Gen	Church	48	20	6	72	504
St. Harrison, 550—Lewis and Clark	Gen	Church	48	20	6	72	504
Veterans Admin. Facility	Gen	Vet	145	118	..	..	959
St. Missoula (Missoula P.O.), 400—Missoula	Gen	Army	36	31	..	..	563
Station Hospital	Gen	Army	36	31	..	..	563
St. Peck, 4,000—Valley	Gen	Army	30	16	..	..	847
Fort Peck Hospital	Gen	Army	30	16	..	..	847
Asgrow, 2,216—Valley	Gen	Church	60	23	12	252	1,373
Frances Mahon Deaconess	Gen	Church	60	23	12	252	1,373
Hospital	Gen	County	20	12	6	46	482
Valley County Hospital	Gen	County	25	18	5	53	396
Endive, 4,629—Dawson	Gen	County	25	18	5	53	396
Dawson County Hospital	Gen	NPAssn	60	33	7	45	1,306
Northern Pacific Beneficial	Gen	NPAssn	60	33	7	45	1,306
Association Hospital	Gen	NPAssn	60	33	7	45	1,306
East Falls, 28,822—Cascade	Gen	Church	225	150	50	429	4,202
Columbus Hospital	Gen	Church	200	102	28	420	2,902
Montana Deaconess Hosp., 0. Gen	Gen	Church	200	102	28	420	2,902
amilton, 1,839—Ravalli	Gen	NPAssn	30	19	8	170	814
Marcus Daly Memorial Hos-	Gen	NPAssn	30	19	8	170	814
pital	Gen	NPAssn	30	19	8	170	814
ardis, 1,169—Big Horn	Gen	Corp	30	10	4	99	426
Hardin General Hospital	Gen	Corp	30	10	4	99	426
Artem, 705—Blaine	Gen	IA	51	25	8	96	956
Fort Belknap Indian Hos-	Gen	IA	51	25	8	96	956
pital and Sanitarium	Gen	IA	51	25	8	96	956
avre, 6,372—Hill	Gen	Church	53	27	12	131	992
Kennedy Deaconess Hosp., 4. Gen	Gen	Church	100	52	13	218	2,134
Sacred Heart Hospital	Gen	Church	100	52	13	218	2,134
Helena, 11,803—Lewis and Clark	Gen	Church	80	36	20	225	1,251
St. John Hospital	Gen	NPAssn	54	35	10	145	1,045
St. Peter's Hospital	Gen	NPAssn	54	35	10	145	1,045
Shodair Crippled Children's	Gen	NPAssn	35	14	..	..	109
Hospital	Gen	NPAssn	35	14	..	..	109
ordan, 500—Garfield	Gen	Church	20	12	4	35	152
Good Samaritan Hospital	Gen	Church	37	24	10	138	1,239
Kalspell, 6,094—Flathead	Gen	Church	37	24	10	138	1,239
Kalspell General Hospital	Gen	Church	37	24	10	138	1,239
ame Deer, 69—Rosebud	Gen	IA	44	27	6	30	555
Tongue River Agency Hosp. Gen	Gen	IA	44	27	6	30	555
Lewistown, 5,338—Fergus	Gen	Church	135	72	16	215	2,527
St. Joseph's Hospital	Gen	Church	135	72	16	215	2,527
Libby, 1,752—Lincoln	Gen	Indiv	15	8	6	50	300
Libby General Hospital	Gen	Indiv	15	8	6	50	300
Livingston, 6,391—Park	Gen	Indiv	22	14	6	41	429
Park Hospital	Gen	Indiv	22	14	6	41	429
Hiles City, 7,175—Custer	Gen	Church	93	50	9	120	1,620
Miles City Hospital (Holy	Gen	Church	93	50	9	120	1,620
Rosary Hospital)	Gen	Church	93	50	9	120	1,620
Missoula, 14,657—Missoula	Gen	NPAssn	76	44	..	..	1,586
Northern Pacific Beneficial	Gen	NPAssn	76	44	..	..	1,586
Association Hospital	Gen	NPAssn	76	44	..	..	1,586
St. Patrick Hospital	Gen	Church	102	74	18	337	2,725
Thornton Hospital	Gen	Church	35	24	8	155	1,206
Plentywood, 1,226—Sheridan	Gen	NPAssn	15	10	5	98	426
Sheridan Memorial Hospital	Gen	NPAssn	15	10	5	98	426
Poplar, 1,046—Roosevelt	Gen	IA	30	30	5	123	1,161
Fort Peck Indian Agency	Gen	IA	30	30	5	123	1,161
Hospital	Gen	IA	30	30	5	123	1,161
Roundup, 2,577—Missoula	Gen	Indiv	20	2	6	50	425
Musselshell Valley Hospital. Gen	Gen	Indiv	20	2	6	50	425
St. Ignace, 727—Lake	Gen	Church	40	24	7	120	1,021
Holy Family Hospital	Gen	Church	40	24	7	120	1,021
Sidney, 2,010—Richland	Gen	Church	31	21	6	142	945
Sidney Deaconess Hospital	Gen	Church	31	21	6	142	945
Townsend, 733—Broadwater	Gen	Corp	30	18	4	40	387
Broadwater Hospital	Gen	Corp	30	18	4	40	387
Warm Springs, 1,900—Deer Lodge	Gen	State	1,012	1,002	..	..	522
Montana State Hospital	Gen	State	1,012	1,002	..	..	522
Wolf Point, 1,539—Roosevelt	Gen	Indiv	16	12	3	36	299
Wilt Hospital	Gen	Indiv	16	12	3	36	299

Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Silver Bow County Hosp., Inst	Gen	County	130	120	8	48	385
Great Falls, 28,822—Cascade	Gen	CyCo	25	4	4	..	68
Detention Hospital	Gen	CyCo	25	4	4	..	68
Helena, 11,803—Lewis and Clark	Gen	NPAssn	19	5	6	48	64
Florence Crittenton Home	Gen	NPAssn	19	5	6	48	64
Lewis and Clark County	Gen	NPAssn	19	5	6	48	64
Hospital	Gen	NPAssn	19	5	6	48	64
Lewistown, 5,338—Fergus	Gen	County	75	42	2	14	240
Fergus County Hospital	Gen	County	75	42	2	14	240
Polson, 1,453—Lake	Gen	Church	25	8	8	48	543
Hotel Dieu Hospital	Gen	Church	25	8	8	48	543
Scobey, 1,230—Daniels	Gen	Indiv	20	6	4	47	180
Scobey Clinic Hospital	Gen	Indiv	20	6	4	47	180
Shelby, 2,004—Toole	Gen	Indiv	20	..	..	..	Not data supplied
New Shelby Hospital	Gen	Indiv	20	..	..	..	Not data supplied
Terry, 770—Prairie	Gen	Church	18	7	6	31	205
Lutheran Good Samaritan	Gen	Church	18	7	6	31	205
Hospital	Gen	Church	18	7	6	31	205
White Sulphur Springs, 575—Meagher	Gen	Indiv	12	1	3	9	70
McKay Hospital	Gen	Indiv	12	1	3	9	70

NEBRASKA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinetg	Number of Births	Admis- sions †
Ainsworth, 1,376—Brown							
Ainsworth Hospital	Gen	Part	18	9	5	126	651
Alliance, 6,669—Box Butte							
St. Joseph's Hospital▲◊....	Gen	Church	100	82	12	202	2,561
Auburn, 3,008—Nemaha							
Auburn Hospital	Gen	Indiv	20	6	4	49	305
Tusbia General Hospital....	Gen	Indiv	10	7	4	73	300
Aurora, 2,715—Hamilton							
Aurora Hospital	Gen	Indiv	16	5	8	27	189
Beatrice, 10,297—Gage							
Lutheran Hospital▲	Gen	Church	45	22	8	206	814
Mennonite Deaconess Home							
and Hospital	Gen	Church	30	22	10	200	791
Blair, 2,791—Washington							
Blair Hospital	Gen	Indiv	14	...	4	Reopened	
Broken Bow, 2,715—Custer							
Broken Bow Hospital.....	Gen	Indiv	25	8	4	6	250
Burwell, 1,156—Garfield							
Dr. Roy S. Cram's Hospital	Gen	Indiv	10	3	4	23	125
Cambridge, 1,203—Furnas							
Republican Valley Hospital.	Gen	Indiv	25	5	2	9	126
Chadron, 4,606—Dawes							
Chadron Municipal Hospital	Gen	City	23	12	7	54	477
Columbus, 6,808—Platte							
Lutheran Good Samaritan							
Hospital	Gen	Church	30	13	5	61	436
St. Mary's Hospital▲.....	Gen	Church	135	23	12	128	669
David City, 2,333—Butler							
David City Hospital.....	Gen	NPAssn	13	3	4	31	158
Fairbury, 6,192—Jefferson							
Fairbury Hospital	Gen	Indiv	15	9	4	52	329
Falls City, 5,787—Richardson							
Falls City Hospital.....	Gen	Indiv	35	13	5	25	413
Fort Crook, 75—Sarpy							
Station Hospital▲	Gen	Army	50	31	..	...	717
Genoa, 1,089—Nance							
Genoa Hospital	Gen	Indiv	8	3	2	23	82
Grand Island, 18,041—Hall							
Grand Island Hospital.....	Gen	Church	23	9	6	81	432
St. Francis Hospital▲◊....	Gen	Church	150	70	10	197	1,818
Hastings, 15,490—Adams							
Mary Lanning Memorial							
Hospital▲	Gen	NPAssn	85	51	15	244	1,980
Holdrege, 3,263—Phelps							
Holdrege Hospital	Gen	Indiv	18	6	5	25	291
Imperial, 946—Chase							
Imperial Community Hosp..	Gen	NPAssn	14	8	4	107	423
Ingleside, 1,639—Adams							
Hastings State Hospital▲◊.	Ment	State	1,700	1,662	..	...	473
Kearney, 8,575—Buffalo							
Good Samaritan Hospital... Gen	Gen	Church	55	30	12	212	1,214
Hospital for the Tuberculous TB		State	212	154	..	...	156
Kimball, 1,711—Kimball							
Flett Hospital	Gen	Indiv	9	4	5	50	267
Lexington, 2,962—Dawson							
Lexington Community Hosp.	Gen	Corp	25	8	6	133	330
Lincoln, 75,933—Lancaster							
Bryan Memorial Hospital▲▲◊	Gen	Church	100	77	20	299	2,424
Green Gables, Dr. Benj. F.							
Bayley Sanatorium	Gen	Corp	120	108	6	14	553
Lincoln General Hospital▲◊	Gen	City	154	99	22	463	3,366
Lincoln State Hospital▲... Ment	Ment	State	1,240	1,227	..	...	190
Nebraska Orthopedic Hosp.▲	Orth	State	110	85	..	...	769
St. Elizabeth's Hospital▲◊.	Gen	Church	175	102	25	456	4,370
Veterans Admin. Facility▲..	Gen	Vet	250	194	..	...	1,724
Loup City, 1,446—Sherman							
Loup City Hospital.....	Gen	Indiv	10	6	4	45	270
Lynch, 498—Boyd							
Sacred Heart Hospital.....	Gen	Church	18	6	3	33	225
McCook, 6,688—Redwillow							
St. Catherine of Sienna							
Hospital▲	Gen	Church	60	20	10	111	905
Minden, 2,716—Kearney							
Seeley Hospital	Gen	Indiv	12	8	10	63	267
Nebraska City, 7,230—Otoe							
St. Mary's Hospital.....	Gen	Church	70	30	12	238	1,240
Norfolk, 10,717—Madison							
Lutheran Hospital	Gen	Church	65	31	10	194	1,113
Norfolk State Hospital▲.. Ment	Ment	State	1,060	1,065	..	...	112
Our Lady of Lourdes Hosp. Gen	Gen	Church	30	13	8	85	581
Verges Sanitarium	Gen	Indiv	30	21	5	18	222
North Platte, 12,061—Lincoln							
General Hospital	Gen	Indiv	23	12	5	46	508
St. Mary Hospital.....	Gen	Church	56	35	10	160	1,288
Oakland, 1,433—Burt							
Oakland Community Hosp..	Gen	Indiv	12	4	3	52	236
Omaha, 214,006—Douglas							
Bishop Clarkson Memorial							
Hospital▲▲◊	Gen	Church	135	98	12	277	3,531
Creighton Memorial St.							
Joseph's Hospital▲▲◊ ... Gen	Gen	Church	372	234	37	856	8,451
Douglas County Hospital▲..	Gen	County	400	314	12	55	2,203
Douglas County Psychiatric							
Hospital.....	Unit of Douglas County Hospital						

NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Immanuel Deaconess Institute* ⁴⁰	Gen	Church	120	95	26	586	4,550
Lutheran Hospital	Gen	Church	111	61	10	247	2,252
Nebraska Methodist Episcopal Hospital and Deaconess Home* ⁴⁰	Gen	Church	175	110	19	407	4,583
Nicholas Senn Hospital	Gen	NPAssn	90	48	12	185	2,873
St. Catherine's Hospital* ⁴⁰	Gen	Church	150	76	25	489	3,245
Station Hospital	Gen	Army	8	3	..	..	124
University of Nebraska Hospital* ⁴⁰	Gen	State	210	167	20	481	3,439
Ord, 2,226—Valley	Gen	Indiv	15	7	4	16	254
Ord Hospital	Gen	Indiv	15	7	4	16	254
Oxford, 1,155—Furnas	Gen	Corp	15	6	6	44	219
Oxford General Hospital	Gen	Corp	15	6	6	44	219
Pawnee City, 1,575—Pawnee	Gen	Indiv	26	19	4	81	650
Pawnee Hospital	Gen	Indiv	26	19	4	81	650
Pender, 1,006—Thurston	Gen	Indiv	12	4	5	46	210
Logan Valley Hospital	Gen	Indiv	12	4	5	46	210
Scottsbluff, 8,465—Scotts Bluff	Gen	Indiv	30	23	6	138	909
Falraeres Hospital	Gen	Indiv	30	23	6	138	909
West Nebraska Methodist Episcopal Hospital ⁴⁰	Gen	Church	50	32	12	100	1,501
Seward, 2,737—Seward	Gen	Part	25	8	5	23	412
Seward Clinic Hospital	Gen	Indiv	15	4	6	54	200
Seward Hospital	Gen	Indiv	15	4	6	54	200
Sidney, 3,306—Cheyenne	Gen	Indiv	17	8	4	41	364
Roche Hospital	Gen	Part	20	6	5	45	265
Taylor Hospital	Gen	Part	20	6	5	45	265
Stromsburg, 1,320—Polk	Gen	Indiv	8	4	2	27	185
Stromsburg Hospital	Gen	Indiv	8	4	2	27	185
Stuart, 763—Holt	Gen	Indiv	20	11	3	32	404
Wilson Hospital	Gen	Indiv	20	11	3	32	404
Valentine, 1,672—Cherry	Gen	Indiv	15	8	5	27	443
General Hospital	Gen	Indiv	15	8	5	27	443
Wahoo, 2,689—Saunders	Gen	Indiv	20	8	6	68	415
Community Hospital	Gen	Indiv	20	8	6	68	415
Winnebago, 653—Thurston	Gen	IA	63	35	9	84	794
Winnebago Indian Hospital	Gen	IA	63	35	9	84	794
York, 5,712—York	Gen	Church	50	20	10	125	876
Lutheran Hospital	Gen	Church	50	20	10	125	876

Related Institutions

Axtell, 328—Kearney	MeDe	Church	155	148	4	..	20
Bethpage Inner Mission	MeDe	Church	155	148	4	..	20
Beatrice, 10,297—Gage	MeDe	State	1,373 ¹	1,373	..	..	93
Nebraska Institution for Feeble-minded	MeDe	State	1,373 ¹	1,373	..	..	93
Beemer, 571—Cuming	Gen	Indiv	10	1	2	9	80
Beemer Hospital	Gen	Indiv	10	1	2	9	80
Dalton, 453—Cheyenne	Gen	Indiv	10	3	4	30	130
Pioneer Memorial Hospital	Gen	Indiv	10	3	4	30	130
Farnam, 594—Dawson	Gen	Indiv	12	3	4	56	478
Reeves Memorial Hospital	Gen	Indiv	12	3	4	56	478
Fremont, 11,407—Dodge	Gen	Church	25	14	9	157	853
Lutheran Good Samaritan Hospital	Gen	Church	25	14	9	157	853
Friend, 1,214—Saline	Gen	City	12	3	4	62	136
Warren Memorial Hospital	Gen	City	12	3	4	62	136
Geneva, 1,662—Fillmore	Gen	Indiv	20	3	10	52	263
Geneva General Hospital	Gen	Indiv	20	3	10	52	263
Genon, 1,089—Nance	Gen	Part	6	1	3	27	117
Emergency Hospital	Gen	Part	6	1	3	27	117
Hebron, 1,504—Thayer	Gen	Indiv	20	8	5	48	400
Blue Valley Hospital	Gen	Indiv	20	8	5	48	400
Kimball, 1,711—Kimball	Gen	Part	10	..	3	Reopened	..
Kimball Hospital	Gen	Part	10	..	3	Reopened	..
Lincoln, 75,933—Lancaster	Inst	State	18	11	..	..	481
Nebraska State Penitentiary	Inst	State	18	11	..	..	481
Millford, 832—Seward	Inst	State	55	28	11	41	42
Nebraska Industrial Home	Inst	State	55	28	11	41	42
Odell, 472—Gage	Gen	Indiv	10	7	4	60	250
Odell General Hospital	Gen	Indiv	10	7	4	60	250
Omaha, 214,066—Douglas	City	City	40	4	..	..	80
City Emergency Hospital	City	City	40	4	..	..	80
Salvation Army Booth Memorial Hospital	Mat	Church	71	42	18	109	116
Orchard, 505—Antelope	Gen	Indiv	7	1	3	6	100
Orchard Hospital	Gen	Indiv	7	1	3	6	100
Plainview, 1,216—Pierce	Gen	NPAssn	8	2	1	14	160
Plainview General Hospital	Gen	NPAssn	8	2	1	14	160
Stratton, 673—Hitchcock	Gen	Indiv	13	2	4	18	129
Stewart Hospital	Gen	Indiv	13	2	4	18	129
Sutherland, 753—Lincoln	Gen	NPAssn	10	3	3	29	98
Sutherland Hospital	Gen	NPAssn	10	3	3	29	98
Sutton, 1,540—Clay	Gen	Indiv	12	3	2	27	176
Sutton Hospital	Gen	Indiv	12	3	2	27	176
Tecumseh, 1,501—Johnson	Gen	Indiv	10	3	2	24	167
Tecumseh Hospital	Gen	Indiv	10	3	2	24	167
Tilden, 1,106—Madison	Gen	Indiv	11	3	3	20	156
Tilden Hospital	Gen	Indiv	11	3	3	20	156
Walthill, 1,162—Thurston	Gen	Indiv	12	2	4	12	82
Walthill Memorial Hosp.	Gen	Indiv	12	2	4	12	82
Dr. Picotte Memorial Hosp.	Gen	Indiv	12	2	4	12	82
Westpoint, 2,255—Cuming	Inst	Gen	15	7	7	57	280
St. Joseph Home and Hos- pital	Inst	Gen	15	7	7	57	280

NEVADA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Caliente, 1,400—Lincoln	Gen	County	13	..	4	Estab. 18	..
Lincoln County Hospital	Gen	County	13	..	4	Estab. 18	..
East Ely, 600—White Pine	Gen	NPAssn	45	19	7	89	39
Steptoe Valley Hospital	Gen	NPAssn	45	19	7	89	39
Elko, 3,217—Elko	Gen	County	48	24	8	105	74
Elko General Hospital	Gen	County	48	24	8	105	74
Ely, 3,045—White Pine	Gen	County	50	25	4	46	53
White Pine County and Gen- eral Hospital	Gen	County	50	25	4	46	53
Las Vegas, 5,165—Clark	Gen	Corp	35	24	11	121	1,075
Las Vegas Hospital	Gen	Corp	35	24	11	121	1,075
Reno, 18,520—Washoe	Gen	Corp	35	24	11	121	1,075
Nevada State Hospital for Mental Diseases	Ment	State	375 ¹	346	..	..	7
St. Mary's Hospital	Gen	Church	75	61	15	210	1,871
Veterans Admin. Facility	Gen	Gen	26	16	..	..	10
Washoe General Hospital	Gen	County	100	153	17	358	2,722
Schurz, 75—Mineral	Gen	IA	34	21	4	34	30
Walker River Indian Hosp.	Gen	IA	34	21	4	34	30
Stewart, 412—Ormsby	Gen	IA	33	20	4	12	571
Carson Indian Hospital	Gen	IA	33	20	4	12	571
Tonopah, 2,115—Nye	Gen	NPAssn	20	10	3	34	20
Tonopah Mines Hospital	Gen	NPAssn	20	10	3	34	20
Winemucca, 1,989—Humboldt	Gen	County	50	19	6	60	62
Humboldt County General Hospital	Gen	County	50	19	6	60	62

Related Institutions

Hawthorne, 750—Mineral	Gen	County	24	5	4	25	10
Mineral County Hospital	Gen	County	24	5	4	25	10
Owyhee, 25—Elko	Gen	IA	22	10	4	23	57
Western Shoshone Indian Agency Hospital	Gen	IA	22	10	4	23	57
Stewart, 412—Ormsby	Gen	IA	30	15	..	..	50
Carson Indian School Hosp. Inst	Gen	IA	30	15	..	..	50
Yerington, 1,003—Lyon	Gen	County	16	12	..	4	6
Lyon County Hospital	Gen	County	16	12	..	4	6

NEW HAMPSHIRE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Berlin, 20,018—Coos	Gen	Church	87	63	16	130	1,522
St. Louis Hospital	Gen	Church	87	63	16	130	1,522
Claremont, 12,377—Sullivan	Gen	NPAssn	50	32	11	161	93
Claremont General Hospital	Gen	NPAssn	50	32	11	161	93
Concord, 25,228—Merrimack	Gen	NPAssn	104	63	18	275	2,571
Margaret Pillsbury General Hospital	Gen	NPAssn	104	63	18	275	2,571
New Hampshire Memorial Hospital	Gen	NPAssn	51	37	14	125	92
New Hampshire State Hos- pital	Ment	State	2,275 ¹	2,181	..	..	67
Dover, 13,573—Strafford	Gen	City	60	50	15	242	1,702
Wentworth Hospital	Gen	City	60	50	15	242	1,702
East Derry, 390—Rockingham	Gen	NPAssn	23	9	5	53	311
Alexander-Eastman Hospital	Gen	NPAssn	23	9	5	53	311
Epping, 1,672—Rockingham	Gen	County	37	34	7	89	1,021
Mitchell Memorial Hospital	Gen	County	37	34	7	89	1,021
Exeter, 4,872—Rockingham	Gen	NPAssn	65	44	16	257	1,424
Exeter Hospital	Gen	NPAssn	65	44	16	257	1,424
Franklin, 6,576—Merrimack	Gen	NPAssn	50	22	12	116	616
Franklin Hospital	Gen	NPAssn	50	22	12	116	616
Glendon, 118—Grafton	State	State	140	108	..	..	66
New Hampshire State Sanat. TB	State	State	140	108	..	..	66
Grasmere, 200—Hillsboro	Gen	County	136	107	10	220	1,507
Hillsborough County Gen- eral Hospital	Gen	County	136	107	10	220	1,507
Hanover, 3,043—Grafton	Gen	NPAssn	184	129	12	220	4,553
Mary Hitchcock Memorial Hospital	Gen	NPAssn	184	129	12	220	4,553
Keene, 13,794—Cheshire	Gen	NPAssn	85	62	15	275	2,125
Elliot Community Hosp.	Gen	NPAssn	85	62	15	275	2,125
Laconia, 12,471—Belknap	Gen	Corp	80	70	25	201	2,573
Laconia Hospital	Gen	Corp	80	70	25	201	2,573
Lancaster, 2,887—Coos	Gen	NPAssn	18	13	5	74	45
Lancaster Hospital	Gen	NPAssn	18	13	5	74	45
Littleton, 4,553—Grafton	Gen	NPAssn	50	22	6	103	722
Littleton Hospital	Gen	NPAssn	50	22	6	103	722
Manchester, 76,834—Hillsboro	Unit of Elliot Hospital	Unit of Elliot Hospital	65	22	423	2,243	..
Balch Hospital	Gen	NPAssn	122	11	6	19	23
Elliot Hospital	Gen	NPAssn	122	11	6	19	23
Lucy Hastings Hospital	Gen	Church	75	61	15	218	1,500
Notre-Dame de Lourdes Hos- pital	Gen	Church	75	61	15	218	1,500
Our Lady of Perpetual Help	Mat	Church	22	11	19	315	24
Maternity Hospital	Mat	Church	22	11	19	315	24
Sacred Heart Hospital	Gen	Church	85	51	..	..	1,575
Nashua, 31,463—Hillsboro	Gen	NPAssn	84	61	15	235	1,441
Nashua Memorial Hosp.	Gen	NPAssn	84	61	15	235	1,441
St. Joseph's Hospital	Gen	Church	92	53	13	222	2,741
New London, 812—Merrimack	Gen	NPAssn	20	7	6	12	57
New London Hospital	Gen	NPAssn	20	7	6	12	57
Newport, 4,632—Sullivan	Gen	NPAssn	20	13	8	6	57
Carrie F. Wright Hospital	Gen	NPAssn	20	13	8	6	57

NEW JERSEY—Continued

Related Institutions									
Epping, 1,672—Rockingham									
Rockingham County Farm									
Hospital	Inst	County	67	51	..	...	137		
Exeter, 4,872—Rockingham									
Lamont Infirmary	Inst	NPAssn	53	12	..	...	816		
Laconia, 12,471—Belknap									
Laconia State School	MeDe	State	616 ¹	612	..	...	50		
Lebanon, 7,072—Grafton									
Alice Peck Day Memorial									
Hospital	Gen	NPAssn	18	9	8	107	275		
Manchester, 70,834—Hillsboro									
Manchester Isolation Hosp.	Iso	City	67	11	..	...	184		
Portsmouth, 14,495—Rockingham									
Mark H. Wentworth Home									
for Chronic Invalids	Incur	NPAssn	52	50	..	...	9		
West Stewartstown, 350—Coos									
Coos County Hospital	Gen	County	40	25	5	49	414		
Woodsville, 1,500—Grafton									
Grafton County Hospital	Gen	County	32	33	4	34	334		

Hospitals and Sanatoriums

Key to symbols and abbreviations is on page 1195

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Blankets	Number of Births	Admissions †
Elizabeth, 114,589—Union							
Alexian Brothers Hospital*▲ Gen		Church	163	125	..	...	2,408
Elizabeth General Hospital and Dispensary*▲○	Gen	NPAasn	226	164	33	974	6,100
St. Elizabeth Hospital*▲○ ... Gen		Church	218	166	44	855	4,259
Englewood, 17,805—Bergen							
Englewood Hospital*▲○ Gen		NPAasn	196	152	42	872	5,686
Fort Dix, —Burlington							
Station Hospital	Gen	Army	124	66	1	1	2,171
Fort Hancock, —Monmouth							
Station Hospital	Gen	Army	50	12	2	2	401
Franklin, 4,176—Sussex							
Franklin Hospital*▲	Gen	NPAasn	26	14	6	83	471
Glen Gardner, 554—Hunterdon							
New Jersey Sanatorium for Tuberculous Diseases*▲.....	TB	State	494	452	..	...	353
Grenloch, 255—Camden							
Camden County General Hospital	Gen	County	160	164	..	...	1,310
Camden County Hospital for Mental Diseases.....	Ment	County	750	751	..	...	196
Lakeland Sanatorium®	TB	County	240	220	..	...	234
Greystone Park, —Morris							
New Jersey State Hosp.*▲○ Ment		State	5,500 ¹	5,416	..	...	1,229
Hackensack, 24,568—Bergen							
Hackensack Hospital*▲○ ... Gen		NPAasn	250	232	42	1,159	8,506
Hasbrouck Heights, 5,658—Bergen							
Hasbrouck Heights Hospital Orth		NPAasn	31	20	..	...	476
Hoboken, 59,261—Hudson							
St. Mary Hospital*▲○	Gen	Church	375	250	25	447	5,782
Irrvington, 50,733—Essex							
Irrvington General Hospital▲ Gen		City	70	63	17	339	2,305
Jersey City, 316,715—Hudson							
Christ Hospital*▲○	Gen	Church	185	185	21	690	5,246
Fairmount Hospital	Gen	NPAasn	50	31	25	139	1,107
Greenville Hospital®	Gen	NPAasn	60	50	16	197	890
Hudson County Tuberculosis Hospital*▲	TB	County	500	473	..	...	723
Jersey City Hospital*▲○ ... Gen		City	900	818	..	...	17,642
Jersey City Hospital for Communicable Diseases.....	Unit of Jersey City Hospital						
Margaret Hague Maternity Hospital*▲○	Mat	County	272	200	284	5,332	6,387
Psychopathic Hospital.....	Unit of Jersey City Hospital						
St. Francis' Hospital*▲○	Gen	Church	228	139	12	141	3,849
Kearny (Arlington P.O.), —40,716—Hudson							
West Hudson Hospital▲	Gen	NPAasn	63	48	12	219	1,871
Lakehurst, 947—Ocean							
U. S. Naval Dispensary and Family Hospital	Gen	Navy	10	1	3	12	83
Lakewood, 5,000—Ocean							
Paul Kimball Hospital▲	Gen	NPAasn	65	43	11	164	1,531
Long Branch, 18,399—Monmouth							
Dr. E. C. Hazard Hospital. Gen		NPAasn	95	77	30	271	4,002
Monmouth Memorial Hospital*▲○	Gen	NPAasn	181	161	30	640	5,045
Lyons, —Somerset							
Veterans Admin. Facility▲ .. Ment		Vet.	1,750	1,084	..	...	386
Marlboro, 500—Monmouth							
New Jersey State Hospital*▲ Ment		State	2,500 ¹	2,236	..	...	731
Metuchen, 5,748—Middlesex							
Roosevelt Hospital	TB	County	221	217	..	...	300
Midland Park, 3,638—Bergen							
Christian Sanatorium	N&M	NPAasn	190	165	..	...	222
Millville, 14,703—Cumberland							
Millville Hospital	Gen	NPAasn	36	31	6	136	866
Montclair, 42,017—Essex							
Montclair Community Hospital▲	Gen	NPAasn	56	41	20	302	1,639
Mountainside Hospital*▲▲○	Gen	NPAasn	284	189	42	692	6,423
St. Vincent's Hospital▲	Gen	Church	50	32	12	222	1,085
Morristown, 15,197—Morris							
All Souls Hospital*▲○	Gen	Church	115	73	29	385	2,368
Morristown Memorial Hospital*▲	Gen	NPAasn	137	95	18	265	3,208
Shonghum Mountain Sanat. TB		County	50	49	..	...	47
Mt. Holly, 6,573—Burlington							
Burlington County Hosp.*▲▲ Gen		NPAasn	127	96	18	564	2,006
Neptune, 2,258—Monmouth							
Fitkin Memorial Hospital*▲○ Gen		NPAasn	189	138	35	762	5,129
Newark, 442,337—Essex							
Babies' Hospital—Colt Memorial▲○	Chil	NPAasn	60	37	..	...	1,269
Columbus Hospital	Gen	NPAasn	86	52	15	294	1,912
Community Hospital	Gen	NPAasn	30	23	4	20	462
Hospital and Home for Crippled Children▲	Orth	NPAasn	110	65	..	...	403
Hospital of St. Barnabas and for Women and Children▲▲○	Gen	Church	208	177	27	584	4,788
Newark Beth Israel Hospital*▲○	Gen	NPAasn	381	383	74	1,586	11,733
Newark City Hospital*▲▲○ .. Gen		City	700	624	40	1,803	16,984
Newark Eye and Ear Infirmary*▲	ENT	NPAasn	65	33	..	...	2,210
Newark Memorial Hosp.*▲○ Gen		NPAasn	135	78	30	446	2,921
Presbyterian Hospital▲	Gen	NPAasn	224	187	53	976	7,472
St. James Hospital*▲○	Gen	Church	112	70	21	480	2,793
St. Michael's Hospital*▲○ .. Gen		Church	313	140	22	502	6,222

NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
New Brunswick, 34,555—Middlesex							
Middlesex General Hosp.* ^o	Gen	NPAasn	105	60	20	488	2,318
St. Peter's General Hosp.* ^o	Gen	Church	177	132	33	553	4,427
New Lisbon, 213—Burlington							
Fairview Sanatorium.....	TB	County	120	100	..	...	103
Newton, 5,401—Sussex							
Newton Memorial Hospital ^o	Gen	NPAasn	42	34	11	188	915
Northfield, 2,604—Atlantic							
Atlantic County Hospital for Mental Diseases.....	Ment	County	400	360	..	...	155
Atlantic County Hospital for Tuberculous Diseases (Pine Rest Sanitarium)....	TB	County	50	49	..	...	52
Oceanport, 1,872—Monmouth							
Station Hospital.....	Gen	Army	56	15	4	19	551
Orange, 35,399—Essex							
New Jersey Orthopaedic Hospital and Dispensary* ^o	Orth	NPAasn	36	27	..	...	439
Orange Memorial Hosp.* ^o	Gen	NPAasn	325	225	75	1,074	8,150
St. Mary's Hospital* ^o	Gen	Church	125	68	25	405	2,883
Passaic, 62,950—Passaic							
Beth Israel Hospital.....	Gen	NPAasn	68	47	16	306	1,694
Passaic General Hospital* ^o	Gen	NPAasn	200	150	25	734	4,978
St. Mary's Hospital* ^o	Gen	Church	181	149	37	993	5,716
Paterson, 138,513—Passaic							
Nathan and Miriam Barnert Memorial Hospital* ^o	Gen	NPAasn	116	117	29	663	3,765
Paterson General Hospital* ^o	Gen	NPAasn	284	212	44	1,038	7,391
St. Joseph's Hospital* ^o	Gen	Church	403	233	47	995	6,900
Valley View Sanatorium* ^o ..	TB	County	231	224	..	...	181
Perth Amboy, 43,516—Middlesex							
Perth Amboy General Hospital* ^o	Gen	NPAasn	143	141	20	665	5,170
Phillipsburg, 19,255—Warren							
Warren Hospital.....	Gen	NPAasn	75	50	10	233	1,865
Pinewald (Bayville P.O.),—Ocean							
Royal Pines Hospital.....	Gen	NPAasn	85	19	6	72	551
Plainfield, 34,422—Union							
Muhlenberg Hospital* ^o	Gen	NPAasn	261	174	44	1,064	6,578
Point Pleasant, 2,058—Ocean							
Point Pleasant Hospital....	Gen	NPAasn	26	17	10	78	594
Preakness (Paterson P.O.),—Passaic							
Hope Dell Hospital.....	Gen	County	123	115	..	...	182
Princeton, 6,992—Mercer							
Princeton Hospital* ^o	Gen	NPAasn	64	37	11	118	1,126
Rahway, 16,011—Union							
Rahway Hospital* ^o	Gen	NPAasn	80	53	20	319	1,984
Red Bank, 11,622—Monmouth							
Riverview Hospital.....	Gen	NPAasn	35	22	13	102	568
Ridgewood, 12,188—Bergen							
Bergen Pines, Bergen County Hospital* ^o	IsoTb	County	500	315	..	...	598
Riverside, 4,000—Burlington							
Zurbrugg Memorial Hosp.* ^o	Gen	NPAasn	41	31	15	221	1,178
Salem, 8,047—Salem							
Salem County Memorial Hospital.....	Gen	NPAasn	40	38	10	324	1,504
Scotch Plains, 3,500—Union							
Bonnie Burn Sanatorium* ^o ..	TB	County	407	348	..	...	350
Secaucus, 8,950—Hudson							
Hudson County Contagious Disease Hospital.....	Iso	County	176	61	..	...	1,090
Hudson County Hospital....	Gen	County	250	223	..	...	348
Hudson County Hospital for Mental Diseases.....	Ment	County	1,679	1,591	..	...	329
Skillman, 23—Somerset							
New Jersey State Village for Epileptics.....	Epil	State	1,550 ¹	1,550	..	...	113
Somers Point, 2,073—Atlantic							
Atlantic Shores Hospital....	Gen	NPAasn	65	20	9	95	890
Somerville, 8,235—Somerset							
Somerset Hospital* ^o	Gen	NPAasn	96	88	20	512	2,672
South Amboy, 8,476—Middlesex							
South Amboy Memorial Hospital.....	Gen	NPAasn	35	22	12	165	1,200
Summit, 14,556—Union							
Fair Oaks Sanatorium.....	Nerv	Corp	38	29	..	...	120
Overlook Hospital* ^o	Gen	NPAasn	122	114	26	488	2,939
Sussex, 1,415—Sussex							
Alexander Linn Hospital....	Gen	NPAasn	23	10	5	52	359
Teaneck, 3,200—Bergen							
Holy Name Hospital* ^o	Gen	Church	184	128	41	915	5,108
Trenton, 121,350—Mercer							
Charles Hospital.....	Gen	NPAasn	50	28	10	75	772
F. W. Donnelly Memorial Hospitals.....	TbIso	City	375	234	..	...	468
Glenwood Sanitarium.....	N&M	Indiv	24	17	..	...	67
Mercer Hospital* ^o	Gen	NPAasn	213	127	37	865	5,268
New Jersey State Hospital* ^o	Ment	State	2,921 ¹	2,926	..	...	841
Orthopaedic Hospital and Dispensary.....	Orth	NPAasn	45	28	..	...	218
St. Francis Hospital* ^o	Gen	Church	232	180	29	856	6,429
William McKinley Memorial Hospital* ^o	Gen	NPAasn	123	94	22	456	2,500
Union City, 58,630—Hudson							
Union City General Hospital	Gen	NPAasn	25	15	10	71	699
Verona, 1,161—Essex							
Essex Mountain Sanat.* ^o	TB	County	416	452	..	...	459

NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Vineland, 7,556—Cumberland							
Newcomb Hospital* ^o	Gen	NPAasn	87	42	15	36	1,200
Weehawken (Union City P.O.), 14,485—Hudson							
North Hudson Hospital* ^o ..	Gen	NPAasn	173	107	18	511	3,740
Woodbury, 8,172—Gloucester							
Brewer Hospital.....	Gen	Indiv	18	12	5	75	890
Underwood Hospital* ^o	Gen	NPAasn	47	35	20	241	1,520
Related Institutions							
Atlantic City, 66,198—Atlantic							
Dr. Leonard's Private Sanit. Drug	Indiv		25	...	..	...	12
Bridgeton, 15,699—Cumberland							
Cumberland County Hospital for Insane.....	Ment	County	300	251	..	...	60
Browns Mills, 313—Burlington							
Browns Mills Nursing Cottage.....	TB	Corp	58	37	..	...	46
Manor Nursing Cottage.....	TB	Indiv	40	34	..	...	51
Sycamore Hall Sanatorium..	TB	Indiv	34	27	..	...	31
Caldwell, 5,144—Essex							
Theresa Grotta Home for Convalescents.....	CardConv	NPAasn	40	29	..	...	53
Camden, 118,700—Camden							
Municipal Hospital for Contagious Diseases.....	Iso	City	100	21	..	...	372
Cranford, 6,001—Union							
Brookside Nursing Home....	Conv	Indiv	25	22	..	...	21
Farmingdale, 629—Monmouth							
Tuberculosis Preventorium for Children.....	TB	NPAasn	256	188	..	...	628
Jamesburg, 2,048—Middlesex							
New Jersey State Home for Boys.....	Inst	State	35	12	..	...	720
Jersey City, 316,715—Hudson							
Salvation Army Door-of-Hope Home and Hospital..	Mat	Church	8	...	7	50	74
Longport, 228—Atlantic							
Betty Bacharach Home for Afflicted Children.....	Orth	Frat	100	47	..	...	111
Menlo Park, 358—Middlesex							
New Jersey Home for Disabled Soldiers.....	Inst	State	100	73	..	...	171
Morrisstown, 15,197—Morris							
Aurora Institute.....	Conv	Corp	90	31	..	...	536
Newark, 442,337—Essex							
Florence Crittenton Home..	Mat	NPAasn	45	20	15	42	42
Newark City Almshouse.....	Inst	City	100	88	..	...	315
Newark Convalescent Hosp..	Conv	City	155	140	..	...	60
New Brunswick, 34,555—Middlesex							
Mary Kingsland Macy Willets Infirmary.....	Inst	State	22	2	..	...	290
Rutgers Infirmary.....	Inst	NPAasn	12	2	..	...	212
Newfoundland, 600—Morris							
Idylse Sanatorium.....	TB	Corp	50	21	..	...	31
New Lisbon, 213—Burlington							
Burlington County Hospital for the Insane.....	Ment	County	288	267	..	...	71
State Colony for Feeble-minded Males.....	MeDe	State	800 ¹	793	..	...	97
Ocean Grove, 1,182—Monmouth							
Methodist Home for Aged..	Inst	Church	15	9	..	...	43
Passaic, 62,950—Passaic							
Passaic Municipal Hospital..	Iso	City	31	3	..	...	59
Paterson, 138,513—Passaic							
Paterson City Hospital....	TbIso	City	110	49	..	...	210
Princeton, 6,992—Mercer							
Isabella McCosh Infirmary of Princeton University...	Inst	NPAasn	54	20	..	...	1,522
Rahway, 16,011—Union							
New Jersey Reformatory Hospital.....	Inst	State	16	8	..	...	421
Roseland, 1,038—Essex							
Mountain View Rest.....	N&M	Corp	22	20	..	...	51
Sea Isle City, 850—Cape May							
Sea Isle Hospital and Training School.....	N&M	Corp	70	55	2	4	20
Totowa (Little Falls P.O.), 4,600—Passaic							
North Jersey Training School	MeDe	State	690 ¹	626	..	...	61
Trenton, 123,336—Mercer							
New Jersey State Prison Hospital* ^o	Inst	State	43	29	..	...	54
State Home for Girls.....	Inst	State	50	36	3	39	25
Upper Montclair, —Essex							
Montclair Sanitarium.....	Conv	Part	10	6	..	...	27
Vineland, 7,556—Cumberland							
Maplehurst School.....	MeDe	Indiv	18	16	..	...	1
New Jersey Memorial Home for Disabled Soldiers, Sailors, Marines and Their Wives and Widows.....	Inst	State	65	51	..	...	47
Training School at Vineland	MeDe	NPAasn	50	515	..	...	27
Vineland State School.....	MeDe	State	1,530 ¹	1,512	..	...	81
West Englewood, 2,700—Bergen							
Englewood Sanitarium (Lynwood Lodge).....	N&M	Corp	25	14	..	...	9
Woodbine, 2,164—Cape May							
Woodbine Colony for Feeble-minded Males.....	MeDe	State	720 ¹	673	..	...	51

Key to symbols and abbreviations is on page 1195

NEW MEXICO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admis- sions †
Albuquerque, 26,570—Bernalillo							
Ahepa Silver District Sanat. TB	Fratt		46	45	..	...	35
Albuquerque Indian Sanat.▲ TB	IA		100	89	..	...	189
Atchison, Topeka and Santa Fe Hospital	Indus	NPAasn	67	22	..	...	394
Children's Home and Hosp.Orth		NPAasn	35	16	..	...	297
Methodist Sanatorium	TB	Church	65	46	..	...	64
St. Joseph Sanatorium and Hospital▲	GenTb	Church	172	96	15	368	2,890
Southwestern Presbyterian Sanatorium▲	GenTb	Church	146	92	12	343	2,033
U. S. Indian School Hosp.▲	Gen	IA	66	44	8	67	1,870
Veterans Adm'n. Facility▲	GenTb	Vet	259	217	..	...	1,763
Artesia, 2,427—Eddy							
Artesia Memorial Hospital.. Gen	Indiv		36	...	6	Estab. 1939	
Black Rock (Zuni P.O.),—McKinley							
Zuni Indian Hospital..... Gen	IA		43	14	8	9	410
Carlsbad, 3,708—Eddy							
St. Francis Xavier Hospital. Gen	Church		40	20	7	172	1,139
Clayton, 2,518—Union							
St. Joseph Hospital..... Gen	Church		25	5	5	42	264
Clovis, 8,027—Curry							
Atchison, Topeka and Santa Fe Hospital	Indus	NPAasn	32	16	..	...	376
Clovis Memorial Hospital... Gen	City		50	...	8	Estab. 1939	
Crownpoint, 90—McKinley							
Eastern Navajo Hospital... Gen	IA		65	34	10	57	1,290
Dawson, 2,000—Colfax							
Phelps Dodge Corporation Hospital	Gen	NPAasn	30	3	4	23	158
Deming, 3,377—Luna							
Deming Ladies' Hospital... Gen	NPAasn		21	6	3	14	204
Dulce, 44—Rio Arriba							
Jicarilla Hospital and Sanat. GenTb	IA		75	56	5	23	187
Jicarilla Indian Sanatorium. Unit of Jicarilla Hospital and Sanatorium							
Farmington, 1,350—San Juan							
San Juan Episcopal Indian Mission Hospital	Gen	Church	16	7	1	11	190
San Juan Hospital..... Gen	NPAasn		22	5	5	33	288
Fort Bayard, 1,000—Grant							
Veterans Admin. Facility▲	GenTb	Vet	305	172	..	...	1,126
Fort Stanton, 490—Lincoln							
U. S. Marine Hospital▲..... TB	USPHS		237	194	..	...	194
Fort Wingate, 14—McKinley							
Charles H. Burke Hospital.. Gen	IA		35	29	4	29	946
Gallup, 5,992—McKinley							
St. Mary's Hospital▲..... Gen	Church		90	37	12	143	1,233
Gardiner, 300—Colfax							
Gardiner Hospital	Indus	NPAasn	25	12	..	...	75
Hot Springs, 1,336—Sierra							
Carrie Tingley Hospital for Crippled Children▲	Orth	State	125	82	..	...	212
Virginia Ann Clinic and Hospital	Gen	Indiv	18	12	2	20	900
Las Vegas, 4,719—San Miguel							
Las Vegas Hospital (Car-penter Memorial)	Gen	NPAasn	25	13	5	52	499
New Mexico State Hospital. Ment	State		900 ¹	863	..	...	262
St. Anthony's Hospital..... GenOr	Church		60	31	6	122	914
Lovington, 961—Len							
Lovington General Hospital Gen	Indiv		10	4	4	76	240
Mescalero, 300—Otero							
Mescalero Apache Indian Hospital	Gen	IA	31	15	4	32	525
Raton, 6,090—Colfax							
New Mexico Miners Hosp...▲ Gen	State		76	9	5	66	501
Rehoboth, 150—McKinley							
Rehoboth Mission Hospital. Gen	Church		30	25	10	112	744
Roswell, 11,173—Chaves							
St. Mary's Hospital..... Gen	Church		60	22	8	197	1,134
Santa Fe, 11,176—Santa Fe							
St. Vincent Sanatorium and Hospital▲	GenTb	Church	100	55	11	179	1,323
U. S. Indian Hospital (Chas. F. Lummis Hospital)..... Gen	IA		78	34	6	22	1,024
Santa Rita, 1,590—Grant							
Santa Rita Hospital..... Gen	NPAasn		35	14	10	119	552
Shiprock, 125—San Juan							
Northern Navajo Hospital.. Gen	IA		48	48	4	38	1,228
Silver City, 3,519—Grant							
Swift Memorial Hospital.... Gen	NPAasn		35	16	6	126	1,046
Socorro, 2,038—Socorro							
State Tuberculosis Sanat... TB	State		86	71	..	...	146
Taos, 500—Taos							
Holy Cross Hospital..... Gen	Church		18	11	4	25	387
Tucumcari, 4,143—Quay							
Tucumcari General Hospital. Gen	Indiv		35	10	4	45	800
Valmora, 125—Mora							
Valmora Sanatorium	TB	NPAasn	75	40	..	...	125
Related Institutions							
Dixon, 800—Rio Arriba							
Brooklyn Cottage Hospital. Gen	Church		13	6	6	122	324
Eunice, 100—Len							
Eunice Hospital	Indiv		7	3	2	25	102
Hobbs, 598—Len							
Hobbs General Hospital..... Gen	Indiv		24	11	4	119	955
Lordsburg, 2,009—Hidalgo							
Lordsburg Hospital	Corp		20	5	3	22	261

NEW MEXICO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admis- sions †
Los Lunas, 513—Valencia							
New Mexico Home and Training School for Men-tal Defectives	McDe	State	76 ¹	72	..	...	12
Santa Fe, 11,176—Santa Fe							
New Mexico Penitentiary Hospital	Inst	State	45	3	..	...	395
Springer, 957—Colfax							
Springer Hospital	Gen	Indiv	10	2	3	10	44
Taos, 500—Taos							
Thomas P. Martin Hospital Gen	IA		16	9	3	3	209
Toadlena, 49—San Juan							
Toadlena Hospital	Inst	IA	21	16	..	...	259
Tohatchi, 2,104—McKinley							
Tohatchi General Hospital.. Gen	IA		14	17	3	30	514

NEW YORK

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admis- sions †
Albany, 127,412—Albany							
Albany Hospital*▲	Gen	NPAasn	600	497	52	913	12,200
Anthony N. Brady Mater-nity Home*▲	Mat	Church	55	43	65	1,162	1,269
Child's Hospital	Chil	Church	65	50	..	...	504
Memorial Hospital*▲	Gen	NPAasn	120	93	16	286	2,726
St. Peter's Hospital*▲	Gen	Church	155	125	..	...	3,393
Albion, 4,578—Orleans							
Arnold Gregory Memorial Hospital	Gen	NPAasn	24	12	11	114	471
Amityville, 4,437—Suffolk							
Long Island Home..... N&M	Corp		207	165	..	...	275
Louden-Kneckerbocker Hall.. N&M	Corp		175	146	..	...	250
Reed General Hospital..... Gen	Part		17	12	3	29	347
Amsterdam, 34,817—Montgomery							
Amsterdam City Hospital* Gen	NPAasn		100	50	15	175	1,359
Montgomery Sanatorium .. TB	County		72	66	..	...	65
St. Mary's Hospital*▲	Gen	Church	100	56	22	306	1,777
Auburn, 36,652—Cayuga							
Auburn City Hospital*.... Gen	NPAasn		175	131	25	522	4,862
Mercy Hospital	Gen	Church	80	45	14	205	1,361
Ballston Spa, 4,591—Saratoga							
Benedict Memorial Hospital Gen	NPAasn		16	7	6	77	240
Batavia, 17,375—Genesee							
Batavia Hospital	Gen	NPAasn	70	38	12	278	1,665
St. Jerome Hospital..... Gen	Church		65	53	15	268	1,562
Veterans Admin. Facility▲.. Gen	Vet		297	280	..	...	2,333
Bath, 4,015—Steuben							
Bath Memorial Hospital.... Gen	NPAasn		60	45	8	162	1,603
Veterans Admin. Facility▲.. Gen	Vet		428	382	..	...	2,444
Bay Shore, 4,080—Suffolk							
Dr. King's Hospital..... Gen	Indiv		30	14	6	72	728
Southside Hospital▲..... Gen	NPAasn		82	80	24	535	3,112
Beacon, 11,933—Dutchess							
Craig House	N&M	Corp	77	46	..	...	52
Highland Hospital	Gen	NPAasn	45	26	12	159	1,056
Matteawan State Hospital.. Ment	State		1,425 ¹	1,452	..	...	158
Bedford Hills, 1,000—Westchester							
Montefiore Hospital Country Sanatorium*	TB	NPAasn	230	229	..	...	308
Binghamton, 76,602—Broome							
Binghamton City Hosp.*▲ Gen	City		535	308	40	986	6,666
Binghamton State Hosp.* Gen	State		2,974 ¹	2,771	..	...	512
Our Lady of Lourdes Me-morial Hospital▲	Gen	Church	79	52	22	280	1,418
Brentwood, 531—Suffolk							
Pilgrim State Hospital▲.... Ment	State		9,427 ¹	8,337	..	...	1,553
Ross Sanitarium	Indiv		35	20	3	13	149
Bronxville, 6,387—Westchester							
Lawrence Hospital▲	Gen	NPAasn	86	65	20	291	2,463
Brooklyn, 2,560,401—Kings							
Adelphi Hospital	Gen	Indiv	105	56	16	377	1,930
Bay Ridge Hospital▲..... Gen	Corp		75	56	25	579	2,799
Bensonhurst Maternity Hosp. Mat	Corp		24	13	26	473	486
Bethany Deaconess Hospital Gen	Church		81	51	20	380	1,556
Beth-El Hospital*▲..... Gen	NPAasn		204	174	66	1,819	7,893
Beth Moses Hospital*▲..... Gen	NPAasn		194	136	30	700	4,766
Boro Park General Hospital Gen	Indiv		75	35	35	527	1,913
Brooklyn Cancer Institute*▲ Cancer	City		85	74	..	...	638
Brooklyn Eye and Ear Hos-pital*▲	ENT	NPAasn	143	78	..	...	8,277
Brooklyn Hospital*▲..... Gen	NPAasn		366	291	44	1,082	8,395
Brooklyn State Hospital*▲.. Ment	State		2,866 ¹	3,290	..	...	2,415
Brooklyn Thoracic Hospital TB	NPAasn		125	122	..	...	150
Brooklyn Womens Hospital. Mat	NPAasn		42	34	35	969	1,310
Bushwick Hospital*▲..... Gen	NPAasn		105	77	25	520	2,997
Caledonian Hospital*▲..... Gen	NPAasn		100	63	30	441	2,733
Carson C. Peck Memorial Hospital▲	Gen	NPAasn	98	75	33	558	2,532
Coney Island Hospital*▲.... Gen	City		357	250	52	913	8,634
Crown Heights Hospital.... Gen	Corp		125	120	28	585	3,285
Cumberland Hospital*▲.... Gen	City		361	262	34	1,040	8,545
Evangelical Deaconess Hosp. Gen	Church		95	50	25	447	1,936

Key to symbols and abbreviations is on page 1195

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Fort Hamilton Station Hospital.....	Gen	Army	62	15	..	...	519
Greenpoint Hospital*+A.....	Gen	City	263	260	32	1,045	8,365
Harbor Hospital.....	Gen	NPAasn	60	37	11	65	1,140
Hospital of the Holy Family.....	Gen	Church	135	99	..	...	2,174
House of St. Giles the Cripple.....	Orth	Church	45	35	..	...	63
Israel-Zion Hospital*.....	Gen	NPAasn	364	314	120	3,539	9,975
Jewish Hospital*+A.....	Gen	NPAasn	547	419	114	2,738	12,702
Jewish Sanitarium and Hospital for Chronic Diseases*+A.....	Chr	NPAasn	525	455	..	...	174
Kings County Hospital*+A.....	Gen	City	2,825	2,929	120	3,390	59,063
Kingston Avenue Hosp.*+A.....	Iso	City	510	266	..	...	3,036
Kingsway Hospital.....	Gen	Indiv	21	5	5	155	314
Long Island College Hospital*+A.....	Gen	NPAasn	420	307	47	1,272	9,330
Lutheran Hospital*.....	Gen	Church	88	57	22	614	3,103
Madison Park Hospital.....	Gen	Corp	163	91	37	1,015	3,158
Methodist Hospital*+A.....	Gen	Church	391	281	89	1,632	9,825
Midwood Hospital*.....	Gen	Corp	55	40	17	396	1,531
Norwegian Lutheran Deaconesses' Home and Hospital*+A.....	Gen	Church	162	143	38	798	3,768
Prospect Heights Hosp.*+A.....	Gen	NPAasn	135	94	40	613	3,349
Riverdale Hospital.....	Gen	Corp	40	11	36	282	583
St. Catherine's Hospital*+A.....	Gen	Church	295	224	58	1,151	7,057
St. Catherine's Maternity Hospital.....	Unit of St. Catherine's Hospital						
St. Charles Hospital Orthopedic Clinic.....	Orth	Church	55	49	..	...	209
St. John's Hospital*+A.....	Gen	Church	204	178	30	719	5,260
St. Mary's Hospital*+A.....	Gen	Church	250	204	56	1,115	6,139
St. Peter's Hospital*+A.....	Gen	Church	203	127	23	530	3,546
Samaritan Hospital.....	Gen	Church	65	41	15	436	1,596
Shore Road Hospital.....	Gen	Corp	49	..	..	No data supplied	
Swedish Hospital.....	Gen	NPAasn	75	53	18	244	1,824
U. S. Naval Hospital*+A.....	Gen	Navy	508	401	7	72	3,849
Unity Hospital*.....	Gen	NPAasn	209	160	39	787	4,923
Victory Memorial Hospital.....	Gen	NPAasn	60	43	21	518	1,750
Wade Hospital.....	Gen	Indiv	40	9	14	28	221
Williamsburgh Maternity Hospital.....	Mat	Indiv	69	59	52	977	1,185
Wyckoff Heights Hosp.*+A.....	Gen	NPAasn	169	127	30	689	4,608
Buffalo, 573,076—Erie							
Buffalo Columbus Hospital*+A.....	Gen	NPAasn	140	84	10	180	2,423
Buffalo General Hosp.*+A.....	Gen	NPAasn	446	383	29	692	10,018
Buffalo Hospital of the Sisters of Charity*+A.....	Gen	Church	205	150	24	611	4,079
Buffalo State Hospital*+A.....	Ment	State	2,236	2,206	..	...	572
Central Park Hospital.....	Gen	NPAasn	65	41	15	321	2,474
Children's Hospital*+A.....	Mat/Child	NPAasn	230	220	48	1,075	6,114
Deaconess Hospital*+A.....	Gen	NPAasn	198	153	41	937	5,945
Edward J. Meyer Memorial Hospital (Buffalo City Hospital)*+A.....	Gen	City	1,025	882	38	625	10,961
Emergency Hospital of the Sisters of Charity*+A.....	Gen	Church	166	118	..	...	3,770
Lafayette General Hospital.....	Gen	NPAasn	66	35	17	267	1,275
Mercy Hospital*+A.....	Gen	Church	164	155	34	981	4,296
Millard Fillmore Hosp.*+A.....	Gen	NPAasn	261	188	66	1,409	6,837
Providence Retreat.....	N&M	Church	200	161	..	...	63
St. Mary's Infant Asylum and Maternity Hospital*+A.....	Mat	Church	44	36	44	876	955
State Institute for the Study of Malignant Disease... SkCancer	State	State	100	28	..	...	1,232
U. S. Marine Hospital*+A.....	Gen	USPHS	75	62	..	...	765
Callicoon, 850—Sullivan							
Callicoon Hospital.....	Gen	Indiv	12	7	4	57	231
Callicoon Hospital.....	Gen	NPAasn	99	87	15	112	1,070
Callicoon Hospital.....	Gen	NPAasn	99	87	15	112	1,070
Brigham Hall Hospital..... N&M	Corp	Corp	80	56	..	...	104
Frederick Ferris Thompson Hospital*.....	Gen	NPAasn	124	87	19	319	2,056
Veterans Admin. Facility*+A.....	Ment	Vet	1,115	1,035	..	...	440
Canastota, 4,25—Madison							
Canastota Memorial Hosp.....	Gen	City	22	11	5	70	394
Cassadaga, 40—Chautauque							
Newton Memorial Hospital.....	TB	County	189	174	..	...	95
Castle Point, 23—Dutchess							
Veterans Admin. Facility*+A.....	TB	Vet	479	454	..	...	726
Catskill, 5,082—Greene							
Memorial Hospital of Greene County*+A.....	Gen	County	51	42	12	206	1,619
Central Islip, 675—Suffolk							
Central Islip State Hosp.*+A.....	Ment	State	7,483	7,090	..	...	1,625
Central Valley, 850—Orange							
Falkirk in the Ramapo..... N&M	Corp	Corp	40	20	..	...	15
Chenango Bridge, 200—Broome							
Broome County Tuberculosis Hospital.....	TB	County	126	73	..	...	61
Clifton Springs, 1,510—Ontario							
Clifton Springs Sanitarium and Clinic*+A.....	Gen	NPAasn	275	116	8	87	2,025
Cohoes, 21,200—Albany							
Cohoes Hospital.....	Gen	NPAasn	54	46	10	189	1,570

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Cold Spring, 1,784—Putnam							
Julia L. Butterfield Memorial Hospital.....	Gen	NPAasn	25	16	6	72	59
Cooperstown, 2,909—Otsego							
Mary Imogene Bassett Hospital*+A.....	Gen	NPAasn	95	73	10	130	2,002
Corning, 15,777—Steuben							
Corning Hospital*+A.....	Gen	NPAasn	85	61	25	475	3,567
Cornwall, 1,910—Orange							
Cornwall Hospital*+A.....	Gen	NPAasn	61	47	11	218	1,506
Cortland, 15,043—Cortland							
Cortland County Hospital*+A.....	Gen	NPAasn	123	83	21	233	3,210
Cuba, 1,422—Allegany							
Cuba Memorial Hospital.....	Gen	NPAasn	18	8	6	59	47
Dannemora, 3,348—Clinton							
Dannemora State Hospital.....	Ment	State	1,144	1,040	..	...	16
Dansville, 4,928—Livingston							
Dansville General Hospital.....	Gen	NPAasn	38	20	8	127	63
Delhi, 1,840—Delaware							
Delaware County Tuberculosis Sanatorium.....	TB	County	32	22	..	...	39
Dobbs Ferry, 5,741—Westchester							
Dobbs Ferry Hospital*+A.....	Gen	NPAasn	47	25	11	66	759
Dunkirk, 17,892—Chautauque							
Brooks Memorial Hospital.....	Gen	NPAasn	61	36	10	213	1,521
Elizabethtown, 636—Essex							
Community House Hospital.....	Gen	NPAasn	20	4	5	22	13
Ellenville, 3,280—Ulster							
Veterans Memorial Hospital.....	Gen	NPAasn	14	9	5	90	412
Elmira, 47,397—Chemung							
Arnot-Ogden Memorial Hospital*+A.....	Gen	NPAasn	183	143	30	500	4,687
Chemung County Sanat.....	TB	County	44	40	..	...	467
St. Joseph's Hospital*+A.....	Gen	Church	189	131	27	515	3,777
Endicott, 16,231—Broome							
Bradford Lord Memorial Hospital.....	Unit of Binghamton City Hospital						
Ideal Hospital*+A.....	Gen	City	116	74	30	547	2,703
Farmingdale, 3,373—Nassau							
Nassau County Tuberculosis Hospital*+A.....	TB	County	416	337	..	...	315
Far Rockaway, —Queens							
St. Joseph Hospital.....	Gen	Church	116	97	20	470	3,657
Fillmore, 488—Allegany							
Genesee Country Memorial Hospital.....	Gen	NPAasn	16	5	4	42	130
Fishers Island, 824—Suffolk							
Station Hospital.....	Gen	Army	60	41	..	...	781
Flushing, —Queens							
Flushing Hospital and Dispensary*+A.....	Gen	NPAasn	216	169	78	1,349	7,700
Parsons Hospital.....	Gen	Corp	40	41	12	210	1,067
Physicians Hospital.....	Gen	Corp	118	82	44	1,037	3,291
Station Hospital*+A.....	Gen	Army	75	25	..	...	571
Fort Niagara (Youngstown P.O.), —Niagara							
Station Hospital.....	Gen	Army	42	22	..	...	520
Fort Slocum, Westchester							
Station Hospital.....	Gen	Army	138	39	..	...	1,310
Fort Wadsworth (Staten Island P.O.), —Richmond							
Station Hospital.....	Gen	Army	29	15	..	...	53
Fulton, 12,462—Oswego							
Albert Lindley Lee Memorial Hospital.....	Gen	City	36	24	11	201	1,521
Gabriels, 200—Franklin							
Sanatorium Gabriels.....	TB	Church	128	60	..	...	52
Geneva, 16,053—Ontario							
Geneva General Hospital*+A.....	Gen	NPAasn	76	58	20	265	2,641
Glen Cove, 11,430—Nassau							
North Country Community Hospital*+A.....	Gen	NPAasn	100	72	20	465	2,745
Glens Falls, 18,531—Warren							
Glens Falls Hospital*+A.....	Gen	NPAasn	120	90	30	476	3,215
Westmont Sanatorium.....	TB	County	52	49	..	...	29
Gloversville, 23,009—Fulton							
Nathan Littauer Hospital*+A.....	Gen	NPAasn	105	77	20	311	2,710
Goshen, 2,891—Orange							
Goshen Hospital.....	Gen	NPAasn	40	25	12	192	575
Interples.....	N&M	Indiv	65	40	..	...	29
Gouverneur, 4,015—St. Lawrence							
Stephen B. Van Duzee Hosp.*+A.....	Gen	NPAasn	19	20	10	154	528
Governors Island, —New York							
Station Hospital*+A.....	Gen	Army	170	142	9	121	2,255
Gowanda, 3,012—Cattaraugus							
Townsend Hospital.....	Gen	NPAasn	22	11	8	137	631
Granville, 3,483—Washington							
Emma Loring Stevens Hosp. Gen	NPAasn	NPAasn	16	8	6	83	255
Greenport, 3,062—Suffolk							
Eastern Long Island Hosp.....	Gen	NPAasn	23	15	8	157	631
Harrison, 11,000—Westchester							
St. Vincent's Retreat.....	N&M	Church	209	159	..	...	157
Hastings on Hudson, 7,097—Westchester							
Hastings Hillside Hospital*+A.....	N&M	NPAasn	41	23	..	...	121
Helminth, 35—Erie							
Gowanda State Homeopathic Hospital*+A.....	Ment	State	2,235	2,463	..	...	571
Hempstead, 12,650—Nassau							
Nassau Brook Hospital*+A.....	Gen	County	250	222	15	466	6,156
Merry Hospital.....	Gen	Church	15	17	11	267	571
Station Hospital.....	Gen	Army	25	9	..	...	771

Key to symbols and abbreviations is on page 1195

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Herkimer, 10,446—Herkimer							
Herkimer Memorial Hospital	Gen	NPAasn	31	28	10	126	1,042
Holtsville, 260—Suffolk							
Suffolk Sanatorium	TB	County	162	158	..	..	112
Hornell, 16,250—Steuben							
Bethesda Hospital	Gen	NPAasn	44	25	10	135	940
St. James Mercy Hospital	Gen	Church	93	62	16	294	2,487
Hudson, 12,337—Columbia							
Hudson City Hospital	Gen	Corp	103	80	15	286	3,202
Huntington, 6,200—Suffolk							
Huntington Hospital	Gen	NPAasn	77	63	12	325	2,261
Ilion, 9,890—Herkimer							
Ilion Hospital	Gen	NPAasn	30	22	6	154	1,099
Irrington, 3,067—Westchester							
Irrington House	ChilCard	NPAasn	108	106	..	..	82
Ithaca, 20,708—Tompkins							
Hermann M. Biggs Memorial Hospital	TB	State	250	199	..	..	230
Tompkins County Memorial Hospital	Gen	NPAasn	126	101	22	338	2,476
Jamaica, —Queens							
Jamaica Hospital	Gen	NPAasn	185	158	38	98	4,912
Mary Immaculate Hosp.	Gen	Church	260	203	60	1,346	7,875
Memorial Hospital	Gen	Indiv	41	20	12	164	911
Queens General Hospital	Gen	City	644	566	52	1,724	13,208
Van Wyck Hospital	Gen	Indiv	55	19	18	139	561
Jamestown, 45,155—Chautauqua							
Jamestown General Hosp.	Gen	City	122	78	22	606	4,323
Woman's Christian Association Hospital	Gen	NPAasn	105	74	29	443	3,051
Jefferson, 484—Schoharie							
Jefferson Hospital	Gen	Indiv	8	3	2	6	165
Johnson City, 13,567—Broome							
Charles S. Wilson Memorial Hospital	Gen	NPAasn	318	208	32	579	5,523
Katonah, 1,400—Westchester							
"Four Winds"	N&M	Indiv	35	31	..	..	33
Hillbourne Farms	Nerv	NPAasn	15	3	..	..	6
Pinewood Sanitarium	N&M	Indiv	56	36	..	..	161
Kings Park, 1,067—Suffolk							
Kings Park State Hosp.	Ment	State	6,325 ¹	5,693	..	..	1,758
Kingston, 28,088—Ulster							
Benedictine Hospital (Our Lady of Victory Sanit.)	Gen	Church	84	70	16	232	3,118
Kingston Hospital	Gen	NPAasn	118	79	15	391	2,995
Dr. O. O. Sahler Sanit.	NervDr	Corp	100	30	..	..	73
Ulster County Tuberculosis Hospital	TB	County	56	54	..	..	88
Lackawanna, 23,948—Erie							
Moses Taylor Hospital	Indus	NPAasn	23	12	..	..	214
Our Lady of Victory Hospital	Gen	Church	134	108	26	592	2,747
Lake Kushqua, 10—Franklin							
Stony Wold Sanatorium	TB	NPAasn	145	120	..	..	100
Lake Placid, 2,930—Essex							
Lake Placid General Hosp.	Gen	City	23	17	6	54	366
Liberty, 3,427—Sullivan							
Malmontides Hospital	Gen	Frat	40	19	6	80	683
Workmen's Circle Sanat.	TB	Frat	111	44	..	..	94
Little Falls, 11,105—Herkimer							
Little Falls Hospital	Gen	NPAasn	55	43	13	202	1,535
Livingston, 249—Columbia							
Potts Memorial Hospital	TB	NPAasn	55	47	..	..	26
Lockport, 23,160—Niagara							
Lockport City Hospital	Gen	City	140	71	30	437	2,159
Niagara Sanatorium	TB	County	220	184	..	..	123
Long Beach, 5,817—Nassau							
Long Beach Hospital	Gen	NPAasn	39	25	6	72	1,124
Long Island City, —Queens							
Astoria Sanatorium	Gen	NPAasn	50	16	22	426	819
Boulevard Hospital	Gen	Corp	77	57	28	700	2,518
River Crest Sanitarium	N&M	Corp	132	100	..	..	299
St. John's Long Island City Hospital	Gen	Church	233	181	38	842	5,163
Lowville, 3,424—Lewis							
Lewis County General Hosp.	Gen	StateCo	40	30	8	198	1,301
Lyons, 3,956—Wayne							
Edward J. Barber Hospital	Gen	Indiv	22	13	3	46	356
Lyons Hospital	Gen	Corp	26	16	6	96	462
Malone, 8,637—Franklin							
Alice Hyde Memorial Hosp.	Gen	NPAasn	74	47	12	139	1,545
Marcy, 112—Ononda							
Marcy State Hospital	Ment	State	2,776 ¹	2,437	..	..	632
Medina, 6,071—Orleans							
Medina Memorial Hospital	Gen	NPAasn	35	16	7	121	600
Middle Grove, 260—Saratoga							
Saratoga County Tuberculosis Hospital	TB	County	100	55	..	..	76
Middletown, 21,276—Orange							
Elizabeth A. Horton Memorial Hospital	Gen	NPAasn	90	64	18	226	2,050
Middletown Sanitarium and Hospital	Gen	Indiv	45	32	8	188	901
Middletown State Homeopathic Hospital	Ment	State	3,392 ¹	3,565	..	..	394
Mincola, 8,153—Nassau							
Nassau Hospital	Gen	NPAasn	162	161	30	727	5,403
Mineville, 837—Essex							
Mineville Hospital	Gen	NPAasn	15	15	1	5	265

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Monticello, 3,450—Sullivan							
Hamilton Avenue Hospital	Gen	Indiv	19	..	..	..	No data supplied
Monticello Hospital	Gen	NPAasn	30	13	6	79	595
Mt. Kisco, 5,127—Westchester							
Northern Westchester Hosp.	Gen	NPAasn	100	90	18	428	3,167
Mt. McGregor, —Saratoga							
Metropolitan Life Insurance Company Sanatorium	GenTb	NPAasn	350	207	..	..	312
Mt. Morris, 3,238—Livingston							
Mt. Morris Tuberculosis Hospital	TB	State	250	210	..	..	171
Mt. Vernon, 61,499—Westchester							
Mt. Vernon Hospital	Gen	NPAasn	146	125	35	823	4,299
Mt. Vision, 258—Otsego							
Otsego County Sanatorium	TB	County	26	18	..	..	33
Newark, 7,649—Wayne							
Newark Hospital	Gen	Part	25	19	4	105	848
Newburgh, 31,275—Orange							
Estelle and Walter C. Odell Memorial Sanitarium for Tuberculosis	TB	County	50	51	..	..	29
St. Luke's Hospital	Gen	NPAasn	214	115	19	397	3,741
New Rochelle, 64,000—Westchester							
New Rochelle Hospital	Gen	NPAasn	252	180	42	616	5,397
New York City, 4,211,699—New York							
Babies Hospital	Chil	NPAasn	162	114	..	..	3,456
Beekman Street Hospital	Gen	NPAasn	100	67	..	..	1,916
Bellevue Hospital	Gen	City	2,482	2,573	101	1,485	64,566
Beth David Hospital	Gen	NPAasn	160	142	40	597	3,965
Beth Israel Hospital	Gen	NPAasn	325	258	75	1,911	9,950
Black's Sanatorium	Gen	Corp	50	5	36	55	160
Broad Street Hospital	Gen	NPAasn	117	42	8	46	1,712
Bronx Eye & Ear Infirmary	ENT	NPAasn	54	21	..	..	3,678
Bronx Hospital	Gen	NPAasn	303	252	59	2,299	11,074
Bronx Maternity and Woman's Hospital	GynOb	NPAasn	36	15	36	551	604
Charles B. Towns Hospital	Drug	Corp	50	11	..	..	500
Columbus Hospital	Gen	Church	260	164	40	565	5,049
Columbia Hosp. Extension	See	Mother Cabrini Memorial Hospital					
Community Hospital	Gen	NPAasn	75	34	10	150	1,027
Crotona Park Sanitarium	Gen	Corp	27	15	24	311	712
Doctors Hospital	Gen	NPAasn	275	115	50	592	3,482
Fitch Sanitarium	Gen	NPAasn	71	59	48	711	2,234
Flower and Fifth Avenue Hospitals	Gen	NPAasn	350	249	60	1,196	8,810
Fordham Hospital	Gen	City	553	516	51	1,282	14,552
Franklin Maternity Sanit.	Mat	Indiv	10	4	10	130	140
French Hospital	Gen	NPAasn	270	204	62	1,185	5,847
Gotham Hospital	Gen	Corp	101	52	24	367	1,970
Gouverneur Hospital	Gen	City	200	171	20	286	4,429
Harkness Pavilion for Private Patients	Unit of Presbyterian Hospital						
Harlem Eye & Ear Hosp.	ENT	NPAasn	50	10	..	..	1,735
Harlem Hospital	Gen	City	543	590	99	2,529	18,903
Hospital for Joint Diseases	GenOr	NPAasn	355	327	..	..	6,643
Hospital for Ruptured and Crippled	Orth	NPAasn	250	172	..	..	3,611
Hunts Point Hospital	Gen	Corp	90	51	27	733	2,013
International Medical Center	Gen	NPAasn	70	16	15	18	410
Jewish Maternity Hospital	Unit of Beth Israel Hospital						
Jewish Memorial Hospital	Gen	NPAasn	173	134	36	716	4,755
Knickerbocker Hospital	Gen	NPAasn	230	124	30	549	4,347
Lebanon Hospital	Gen	NPAasn	139	85	15	200	2,603
Left-Central Maternity Hosp.	Mat	Indiv	35	19	35	624	656
Lenox Hill Hospital	Gen	NPAasn	609	430	68	1,179	11,734
Le Roy Sanitarium	Gen	Corp	53	40	14	244	1,216
Lincoln Hospital	Gen	City	399	405	70	1,254	9,666
Lutheran Hospital	Gen	NPAasn	120	80	26	546	2,793
Lying-In Hospital	Unit of New York Hospital						
Manhattan Eye, Ear and Throat Hospital	ENT	NPAasn	212	148	..	..	16,148
Manhattan General Hosp.	Gen	Corp	226	117	22	408	4,766
Manhattan Maternity and Dispensary	Unit of New York Hospital						
Manhattan State Hospital	Ment	State	3,590 ¹	3,318	..	..	1,442
Medical Arts Center Hosp.	Gen	Corp	125	84	13	239	3,326
Memorial Hospital for the Treatment of Cancer and Allied Diseases	Cancer	NPAasn	199	142	..	..	3,012
Metropolitan Hospital	Gen	City	1,653	1,337	58	690	13,151
(Bed capacity decreased during the year from 1,367)							
Midtown Hospital	Gen	NPAasn	61	36	..	..	2,517
Misericordia Hospital	Gen	Church	201	111	62	1,015	3,351
Montefiore Hospital for Chronic Diseases	Gen	NPAasn	714	688	..	..	1,715
Morrisania City Hosp.	Gen	City	471	441	68	1,199	12,044
Mother Cabrini Memorial Hospital	Gen	Church	189	69	30	262	1,782
Mt. Eden Hospital	Gen	Indiv	40	23	30	423	1,532
Mt. Sinai Hospital	Gen	NPAasn	856	630	..	..	16,720
Murray Hill Hospital	Gen	Corp	73	60	8	81	1,834
Nazareth Hospital for Women and Children	TB	Church	305	280	..	..	238
Neurological Institute of New York	Neur	NPAasn	211	144	..	..	3,083
New York City Cancer Institute	Cancer	City	192	185	..	..	863
New York City Hospital	Gen	City	530	663	30	701	10,659

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
New York Eye and Ear Infirmary*†	ENT	NPAssn	170	101	..	...	5,914
New York Foundling Hospital*†	MatChil	Church	187	123	57	775	1,864
New York Hospital*†	Gen	NPAssn	915	811	142	2,757	16,312
New York Infirmary for Women and Children*†	Gen	NPAssn	126	89	41	856	3,651
New York Nursery and Childs Hospital.....	Unit of New York Hospital						
New York Orthopaedic Dispensary and Hospital*†	Orth	NPAssn	301	252	..	...	1,614
New York Polyclinic Medical School and Hospital*†	Gen	NPAssn	329	234	37	775	8,739
New York Post-Graduate Medical School and Hospital*†	Gen	NPAssn	410	304	..	...	9,146
New York Skin and Cancer Hospital.....	Unit of New York Post-Graduate Medical School and Hospital						
New York State Psychiatric Institute and Hospital*†	Ment	State	200†	129	..	...	237
Park East Hospital.....	Gen	Corp	117	87	17	414	3,113
Parkway Hospital.....	Gen	NPAssn	75	26	10	252	1,206
Park West Hospital.....	Gen	Corp	68	45	12	271	2,912
Payne Whitney Psychiatric Clinic*†	Unit of New York Hospital						
Presbyterian Hospital and Sloane Hospital for Women*†	Gen	NPAssn	842	677	144	2,426	17,449
Psychiatric Pavilion of Bellevue Hospital.....	Unit of Bellevue Hospital						
Reconstruction Hospital.....	Unit of New York Post-Graduate Medical School and Hospital						
Riker's Island Hospital....	GenInst	City	250	190	..	...	3,963
Riverside Hospital*†	TbIso	City	332	369	..	3	621
Roosevelt Hospital*†	Gen	NPAssn	397	297	..	...	7,555
St. Ann's Maternity Hosp....	Unit of New York Foundling Hospital						
St. Clare's Hospital.....	Gen	Church	173	149	36	612	3,833
St. Elizabeth's Hospital*†	Gen	Church	185	73	27	525	2,605
St. Francis' Hospital*†	Gen	Church	380	230	35	376	5,641
St. John's Hospital.....	Unit of New York Foundling Hospital						
St. Joseph's Hospital for Consumptives.....	TB	Church	280	273	..	...	687
St. Luke's Hospital*†	Gen	Church	517	353	..	...	8,457
St. Vincent's Hospital*†	Gen	Church	421	399	44	788	10,197
Seton Hospital*†	TB	Church	260	255	..	...	290
Sloane Hospital for Women*†	See Presbyterian Hospital						
Sydenham Hospital*†	Gen	NPAssn	179	162	24	683	4,639
Union Hospital.....	Gen	NPAssn	55	42	20	314	1,460
U. S. Marine Hospital*†	USPHS		464	358	..	2	2,186
University Heights Hospital (Dr. Jameson Sanitarium)	Gen	Corp	49	40	15	407	1,884
Veterans Admin. Facility*†	Vet		973	874	..	...	4,538
Webb Sanitarium.....	Gen	Corp	19	...	No data supplied		
Welfare Hospital for Chronic Diseases*†	Gen	City	1,500	...	Estab.	1939	
Westchester Square Hospital	Corp		107	63	32	825	2,743
Will Hill Sanitarium.....	N&M	Indiv	67	52	..	...	215
Wickersham Hospital.....	Gen	Corp	76	41	9	221	2,397
Willard Parker Hospital*†	TbIso	City	424	297	..	...	4,156
William Booth Memorial Hospital*†	Gen	Church	48	25	24	229	746
Woman's Hospital*†	GynOb	NPAssn	226	154	100	1,729	3,847
Niagara Falls, 75,460—Niagara							
Mt. St. Mary's Hospital*†	Gen	Church	161	126	39	773	4,600
Niagara Falls Memorial Hospital*†	Gen	NPAssn	162	113	25	566	3,868
Northport, 2,523—Suffolk							
Veterans Admin. Facility*†	Ment	Vet	2,200	2,017	..	...	722
North Tonawanda, 19,019—Niagara							
De Graft Memorial Hospital	Gen	City	47	23	18	332	1,577
Norwich, 8,378—Chenango							
Chenango Memorial Hosp.*†	Gen	NPAssn	65	43	15	137	1,463
Nyack, 5,322—Rockland							
Nyack Hospital*†	Gen	Corp	87	65	16	327	2,376
Ogdenburg, 16,915—St. Lawrence							
A. Barton Hepburn Hosp.*†	Gen	Church	140	95	20	363	3,314
St. John's Hospital.....	TB	Church	45	30	..	...	37
St. Lawrence State Hosp.*†	Ment	State	2,226†	2,104	..	...	325
Olean, 21,790—Cattaraugus							
Mountain Clinic.....	Gen	Indiv	33	15	5	53	457
Olean General Hospital*†	Gen	NPAssn	86	37	20	258	1,445
Rocky Crest Sanatorium.....	TB	County	49	34	..	...	59
St. Francis Hospital.....	Gen	Church	109	33	18	234	1,249
Oneida, 10,553—Madison							
Main Street Hospital.....	Gen	Indiv	14	8	4	49	212
Oneida City Hospital*†	Gen	City	82	69	17	199	1,593
Oneonta, 12,326—Otsego							
Aurelia Osborn Fox Memorial Hospital*†	Gen	NPAssn	54	46	12	217	1,664
Homer Folks Tuberculosis Hospital*†	TB	State	220	229	..	...	229
Orangeburg, 320—Rockland							
Rockland State Hospital*†	Ment	State	6,032†	5,520	..	...	1,172
Ossining, 13,241—Westchester							
Ossining Hospital*†	Gen	NPAssn	65	49	19	219	1,633
Stony Lodge.....	N&M	Indiv	44	14	..	...	29

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Oswego, 22,652—Oswego							
Oswego Hospital.....	Gen	NPAssn	100	47	13	281	1,600
Station Hospital.....	Gen	Army	30	12	..	...	6
Otisville, 809—Orange							
Municipal Sanatorium*†	TB	City	400	332	..	...	7
Owego, 4,742—Tioga							
Glenmary Sanitarium.....	N&M	Corp	50	7	..	...	9
Peekskill, 17,125—Westchester							
Peekskill Hospital.....	Gen	NPAssn	77	50	17	293	1,571
Penn Yan, 5,329—Yates							
Soldiers and Sailors Memorial Hospital.....	Gen	NPAssn	46	32	10	170	1,131
Perrysburg, 317—Cattaraugus							
J. N. Adam Memorial Hosp.*†	TB	City	482	437	..	...	29
Philmont, 1,865—Columbia							
Columbia Sanatorium.....	TB	County	76	59	..	...	3
Plattsburg, 13,349—Clinton							
Champlain Valley Hospital*†	Gen	Church	104	87	15	330	2,223
Physicians Hospital.....	Gen	NPAssn	95	64	18	295	2,292
Station Hospital.....	Gen	Army	63	49	2	38	1,742
Pomona, 155—Rockland							
Summit Park Sanatorium..	TB	County	88	83	..	...	75
Port Chester, 22,662—Westchester							
Mary Harkness Home for Convalescent Care.....	Conv	NPAssn	50	31	..	...	43
St. Luke's Convalescent Hospital.....	See Greenwich, Conn.						
United Hospital*†	Gen	NPAssn	166	143	36	715	4,534
Port Jefferson, 2,200—Suffolk							
John T. Mather Memorial Hospital*†	Gen	NPAssn	58	47	12	216	1,545
St. Charles Hospital for Crippled Children.....	Orth	Church	210	194	..	...	71
Wharton Memorial Institute.	Unit of St. Charles Hospital						
Port Jervis, 10,243—Orange							
St. Francis Hospital*†	Gen	Church	55	22	10	83	731
Potsdam, 4,136—St. Lawrence							
Potsdam Hospital*†	Gen	NPAssn	65	45	21	214	1,623
Poughkeepsie, 40,288—Dutchess							
Hudson River State Hosp.*†	Ment	State	4,465†	4,421	..	...	793
St. Francis Hospital*†	Gen	Church	85	71	25	275	2,650
Samuel and Nettie Bowne Hospital.....	TbCard	NPAssn	50	27	..	...	8
Samuel W. Bowne Memorial Hospital.....	TB	CyCo	131	125	..	...	103
Vassar Brothers Hospital*†	NPAssn		192	136	33	646	4,531
Queens Village, —Queens							
Creedmoor State Hospital*†	Ment	State	4,440†	4,393	..	...	974
Ray Brook, 40—Essex							
New York State Hospital*†	TB	State	380	285	..	...	377
Rhinebeck, 1,569—Dutchess							
Northern Dutchess Health Service Center.....	Gen	NPAssn	34	26	9	144	673
Richland, 600—Oswego							
Oswego County Sanatorium	TB	County	105	89	..	...	61
Rochester, 328,132—Monroe							
Genesee Hospital*†	Gen	NPAssn	212	190	32	766	5,713
Highland Hospital*†	Gen	NPAssn	205	144	69	890	5,431
Iola-Monroe County Tuberculosis Sanatorium*†	TB	County	400	345	..	...	272
Monroe County Infirmary.....	Gen	County	500	474	20	159	3,155
Park Avenue Hospital*†	Gen	NPAssn	85	62	18	333	2,462
Rochester General Hosp.*†	Gen	NPAssn	312	269	63	1,107	8,616
Rochester Municipal Hospital*†	Gen	City	321	276	26	824	7,437
Rochester State Hospital*†	Ment	State	3,384†	3,156	..	...	535
St. Mary's Hospital*†	Gen	Church	206	177	62	620	6,721
Strong Memorial Hosp.*†	Gen	NPAssn	272	194	26	397	7,631
Rockaway Beach, —Queens							
Neponsit Beach Hospital for Children.....	ThOr	CyCo	120	116	..	...	123
Rockaway Beach Hospital and Dispensary*†	Gen	NPAssn	100	89	12	247	3,071
Rockville Center, 13,718—Nassau							
South Nassau Communities Hospital.....	Gen	NPAssn	70	65	20	672	2,940
Rome, 32,338—Onelida							
Onelida County Hospital.....	Gen	County	220	201	9	146	2,347
Rome Hospital and Murphy Memorial Hospital*†	Gen	City	53	53	16	416	2,167
Rome Infirmary.....	Gen	Indiv	24	6	6	12	125
Sackett's Harbor, 742—Jefferson							
Station Hospital.....	Gen	Army	23	21	..	...	63
Salamanca, 9,577—Cattaraugus							
City Hospital.....	Gen	City	41	29	10	172	1,271
Sallsbury Center, 331—Herkimer							
Pine Crest Sanatorium.....	TB	County	90	81	..	...	61
Saranac Lake, 5,620—Franklin							
General Hospital*†	Gen	NPAssn	55	29	6	76	74
Northwoods Sanatorium..	TB	NPAssn	26	26	..	...	51
Reception Hospital.....	TB	NPAssn	29	18	..	...	23
St. Mary's of the Lake.....	TB	Church	24	18	..	...	27
Will Rogers Memorial Hosp.*†	TB	NPAssn	75	70	..	...	27
Saratoga Springs, 13,162—Saratoga							
Saratoga Hospital*†	Gen	NPAssn	69	47	17	149	1,225
Schenectady, 65,622—Schenectady							
Eastern New York Orthopaedic Hospital-School.....	O-Chil	NPAssn	55	17	..	...	6
Ellis Hospital*†	Gen	NPAssn	231	222	75	641	4,223

NEW YORK—Continued

REGISTERED HOSPITALS

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Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Schenectady County Tuberculosis Hospital (Glenridge Sanatorium)†	TB	County	145	127	..	..	92
Seneca Falls, 6,413—Seneca Falls Hospital	Gen	City	30	22	11	130	751
Sherburne, 1,077—Chenango County Tuberculosis Hospital	TB	County	33	28	..	..	14
Sodus, 1,444—Wayne Myers Hospital	Gen	Indiv	35	11	7	58	308
Sonyea, —Livingston Craig Colony	Epil	State	2,341	2,301	..	..	325
Southampton, 3,737—Suffolk Southampton Hospital	Gen	NPAasn	61	42	19	250	1,467
Stamford, 1,103—Delaware Batgate Hospital	Gen	NPAasn	20	..	6	31	389
Stapleton (Staten Island P.O.), —Richmond U. S. Marine Hospital	Gen	USPHS	655	573	6	14	7,914
Staten Island, 153,346—Richmond Richmond Borough Hospital	Unit of Sea View Hospital	Gen	100	93	18	247	2,148
St. Vincent's Hospital	Gen	Church	208	165	33	761	5,797
Sea View Hospital	Gen	City	1,520	1,725	10	26	1,771
Staten Island Hospital	TB	Corp	241	164	51	1,052	5,776
Sufferin, 3,757—Rockland Good Samaritan Hospital	Gen	Church	89	61	23	296	2,226
Summunt, —Franklin Veterans Admin. Facility	TB	Vet	518	436	..	..	533
Syracuse, 209,326—Onondaga City Hospital	Gen	City	84	32	..	..	601
Crouse-Irving Hospital	Gen	NPAasn	215	197	25	770	5,684
General Hospital	Gen	NPAasn	85	78	25	621	2,719
Hospital of the Good Shepherd	Gen	NPAasn	210	169	..	..	4,851
Onondaga General Hospital	Gen	NPAasn	56	32	25	32	845
Onondaga Sanatorium	TB	County	255	242	..	..	181
Peoples Hospital	Gen	NPAasn	28	8	8	55	330
St. Joseph Hospital	Gen	Church	200	165	31	793	6,842
St. Mary's Maternity Hospital and Infants Asylum	Mat	Church	44	17	20	328	382
Syracuse Memorial Hospital	Gen	NPAasn	210	188	40	1,160	6,033
Syracuse Psychopathic Hospital	Gen	NPAasn	60	45	..	..	687
Twin Elms	Ment	Indiv	10	7	..	..	45
Tarrytown, 6,841—Westchester Tarrytown Hospital	Gen	NPAasn	57	44	13	249	1,477
Ticonderoga, 3,680—Essex Moses-Ludington Hospital	Gen	NPAasn	47	27	6	95	850
Troy, 72,763—Rensselaer Leonard Hospital	Gen	NPAasn	109	87	16	405	2,583
Marshall Sanitarium	Gen	NPAasn	60	46	..	..	198
Price Memorial Hospital	N&M	NPAasn	34	15	31	404	433
St. Joseph's Maternity Hospital	Unit of Samaritan Hospital	Church	165	126	17	443	4,035
Samaritan Hospital	Mat	Church	272	203	22	334	4,150
Troy Hospital	Gen	Church	35	14	4	41	470
Trudeau, 230—Essex Trudeau Sanatorium	TB	NPAasn	33	20	7	57	601
Tupper Lake, 5,271—Franklin Mercy General Hospital	Gen	NPAasn	114	86	16	330	2,878
Tuxedo Park, 2,000—Orange Tuxedo Memorial Hospital	Gen	NPAasn	200	153	..	..	386
Utica, 101,740—Oneida Paxton Hospital	Gen	NPAasn	188	174	..	..	134
Masonic Soldiers and Sailors Memorial Hospital	Gen	NPAasn	130	118	20	486	3,602
Oneida County Tuberculosis Sanatorium (Broadacres)†	TB	Frat	200	153	..	..	386
St. Elizabeth Hospital	Gen	Church	123	75	23	417	2,800
St. Luke's Home and Hospital	Gen	Church	124	75	14	273	4,339
Utica General Hospital	Gen	City	77	47	24	296	2,397
Utica Memorial Hospital	Gen	State	1,713	1,700	..	..	575
Valhalla, 620—Westchester Grasslands Hospital	Ment	County	600	660	15	213	5,798
Warsaw, 3,477—Wyoming County Community Hospital	Gen	County	115	95	20	353	2,498
Waterloo, 4,047—Seneca Waterloo Memorial Hospital	Gen	NPAasn	25	15	5	84	450
Watertown, 32,203—Jefferson House of the Good Samaritan	Gen	NPAasn	125	89	14	271	2,278
Jefferson County Sanat.	TB	County	78	58	..	..	97
Mercury Hospital	Gen	Church	118	76	18	311	2,322
Waverly, 5,662—Tloga Tloga County General Hospital	Gen	NPAasn	56	50	12	143	1,363
Wayland, 1,814—Steuben Wayland Hospital	Gen	Part	17	12	3	49	352
Wellsville, 5,674—Allegany F. and Gertrude F. Jones Gen Memorial Hospital	Gen	City	45	33	10	222	1,737
West Haverstraw, 2,834—Rockland New York State Reconstructive Home	OrChil	State	310	136	..	..	66
West Point, 1,230—Orange Station Hospital	Gen	Army	162	81	8	67	3,678

Key to symbols and abbreviations is on page 1195

NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
White Plains, 35,830—Westchester New York Hospital—Westchester Division	N&M	NPAasn	350	259	..	..	350
New York Hospital—Westchester Division	N&M	NPAasn	350	259	..	..	350
New York Orthopaedic Dispensary and Hospital, Country Branch	Unit of New York Orthopaedic Dispensary and Hospital, New York City	Gen	139	99	33	529	3,865
St. Agnes Hospital	Gen	Church	176	84	22	280	2,778
White Plains Hospital	Gen	NPAasn	250	222	..	..	4,793
Winifred Masterson Burke Relief Foundation	Conv	NPAasn	3,006	2,910	..	..	488
Willard, 200—Seneca Willard State Hospital	Ment	State	4,800	4,708	..	..	542
Wingdale, 156—Dutchess Harlem Valley State Hospital	Ment	State	400	379	..	..	577
Woodhaven, —Queens St. Anthony's Hospital	TB	Church	152	134	..	..	113
Wyandkill, 167—Rensselaer Pawling Sanatorium	TB	County	55	51	..	..	63
Yonkers, 134,646—Westchester Gray Oaks Hospital	TB	City	98	87	..	..	122
House of Rest at Sprain Ridge	TB	NPAasn	176	154	24	564	5,017
St. John's Riverside Hospital	TB	Church	177	109	20	327	2,801
St. Joseph's Hospital	Gen	NPAasn	137	90	32	528	3,638
Yonkers General Hospital	Gen	NPAasn	100	59	25	336	2,017
Yonkers Professional Hosp. Gen	Gen	NPAasn	100	59	25	336	2,017
Related Institutions							
Albany, 127,412—Albany Albany's Hospital for Incurables	Incur	NPAasn	100	95	..	..	64
St. Margaret's House and Hospital	Incur	Church	50	40	..	..	64
Van Rensselaer Preventorium	Unit of Albany Hospital	Hospital	409	416	3	15	103
Albion State Training Sch.	MeDe	State	40	29	5	17	103
Albion Welfare Hospital	Gen	County	40	29	5	17	103
Erie County Penitentiary	Inst	County	23	9	..	..	102
Amityville, 4,437—Suffolk Brunswick Home	Conv	Nerv Corp	440	313	..	..	1,214
Auburn, 36,652—Cayuga Auburn State Prison	Gen	State	35	..	..	..	No data supplied
Bainbridge, 1,324—Chenango Bainbridge Hospital	Gen	Indiv	12	4	5	29	202
Bedford Hills, 1,000—Westchester Westfield State Farm	Inst	State	48	33	11	..	545
Binghamton, 76,662—Broome Binghamton Training School for Nervous, Backward and Mental Defectives	MeDe	Indiv	50	40	..	..	6
Bresport, 498—Chemung Chemung County Home Infirmary	Inst	County	88	50	..	..	108
Brewster, 1,664—Putnam Mountainbrook Farm Sanit. Nerv	Inst	Indiv	25	18	..	..	56
Brooklyn, 2,500,401—Kings Brooklyn Hebrew Home and Hospital for Aged	Inst	NPAasn	700	549	..	..	267
Churchill Sanitarium	Gen	Indiv	12	4	3	12	98
Faith Home for Incurables	Incur	NPAasn	52	48	..	..	2
Buffalo Eye and Ear Infirmary	ENT	NPAasn	14	7	..	..	765
Crippled Children's Guild	Unit of Children's Hospital	Mat	46	25	30	95	102
Ingleside Home	Calcutm, 111—Jefferson Jefferson County Contagious Hospital	Iso	18	1	..	..	24
Camden, 1,912—Oneida Healthfort—Dr. Bell's Private Rest Home	N&M	Indiv	15	4	2	1	16
Canandaigua, 7,541—Ontario Canandaigua Health Home	Conv	Indiv	20	13	..	..	35
Castile, 900—Wyoming Greene Sanitarium	Conv	Indiv	40	20	..	..	63
Cortland, 15,043—Cortland Ver Neoy Sanitarium	Gen	Indiv	13	10	6	109	343
Dannemora, 3,348—Clinton Tuberculosis Hospital	Inst	State	138	84	..	..	931
Delhi, 1,540—Delaware Delhi Infirmary	Inst	County	14	10	..	..	240
Delhi Hospital	Gen	NPAasn	13	7	6	47	300
Eastview, 161—Westchester Solomon and Betty Loeb Memorial Home for Conv.	Conv	NPAasn	108	108	..	..	1,002
Edmeston, 749—Otsego Otsego School for Backward Children	MeDe	Indiv	27	27	..	..	4
Elmira, 47,397—Chemung Elmira Reformatory	TbChil	County	22	18	..	..	28
Chemung County Preventorium	Inst	State	100	20	..	..	963
Elmira Reformatory	Conv	Indiv	25	12	..	..	75
Glason Health Resort	Conv	Indiv	25	12	..	..	75

NEW YORK—Continued

REGISTERED HOSPITALS

JOUR. A. M. A.
MARCH 22, 1914.

Related Institutions		Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Far Rockaway, —Queens	Home Crest Convalescent	OrChil	NPAasn	110	67	..	133	76
Hancock, 1,427—Delaware	Hancock Hospital	Gen	Indiv	10	2	5	28	269
Hawthorne, 357—Westchester	Rosary Hill Home	Cancer	Church	110	92	..	..	28
Herkimer, 10,446—Herkimer	Herkimer County Home	Home	County	18	16	..	..	28
Herkimer Hospital	Herkimer County Home	Home	County	18	16	..	..	28
Huntington, 6,200—Suffolk	Village Green Maternity	Mat	Indiv	9	1	9	24	23
Industry, 280—Monroe	Industry General Hospital..	Inst	State	50	27	..	1,219	576
Iroquois, 40—Erie	Thomas Indian Sch. Hosp..	Inst	State	36	14	..	..	168
Ithaca, 20,708—Tompkins	Balley-Jones Hospital	Gen	Indiv	14	6	..	..	170
Knoll, 20,708—Tompkins	Knoll Sanitarium	Gen	Indiv	12	6	..	..	38
Reconstruction Home	Reconstruction Home	Orth	NPAasn	17	4	15	126	139
Johnson City, 13,567—Broome	Mrs. Springer's Private Hospital	MatConv	Indiv	11	4	2	12	93
Keene Valley, 400—Essex	Keene Valley Neighborhood House and Hospital	Gen	NPAasn	25	20	..	..	86
Kingston, 28,088—Ulster	Hackett Sanitarium and Nursing Home	Conv	Indiv	18	15	..	..	6
Lake Ronkonkoma, 49—Suffolk	Gary de Vabre Academy	MeDe	Part	15	5	5	36	205
Margaretville, 771—Delaware	Margaretville Hospital	Gen	NPAasn	1,333	1,003	..	..	454
Millgrove (Alden P.O.), 110—Erie	Millgrove (Alden P.O.), 110—Erie	Gen	NPAasn	29	20	8	133	667
Montour Falls, 1,489—Schuyler	Montour Falls, 1,489—Schuyler	Inst	County	25	9	..	..	118
Napanoch, 633—Ulster	Institution for Male Delinquents	MeDe	State	25	9	..	..	118
Newark, 7,649—Wayne	Newark State School	MeDe	State	2,366	2,307	9	15	287
New York City, 4,211,639—New York	Beth Abraham Home for Incurables	Conv	NPAasn	307	253	..	..	64
Bronxwood Sanitarium	Bronxwood Sanitarium	Conv	NPAasn	24	14	..	..	119
Bryant Sanitarium	Bryant Sanitarium	Conv	NPAasn	10	8	10	78	83
Hebrew Convalescent Home	Hebrew Convalescent Home	Conv	NPAasn	87	80	..	..	726
Home for Aged and Infirm	Home for Aged and Infirm	Conv	NPAasn	31	27	..	..	327
Home for Dependents	Home for Dependents	Inst	NPAasn	1,747	1,754	..	..	1,045
Home for Hebrew Infants	Home for Hebrew Infants	Inst	NPAasn	61	27	..	..	1,042
House of Calvary	House of Calvary	Cancer	Church	348	333	..	..	250
Regent Nursing Home	Regent Nursing Home	Conv	Indiv	150	140	..	..	489
Dr. Rogers' Hospital	Dr. Rogers' Hospital	N&M	Indiv	25	10	..	..	103
St. Andrew's Convalescent Hospital	St. Andrew's Convalescent Hospital	Conv	Church	30	13	..	..	238
St. Mary's Hospital for Children	St. Mary's Hospital for Children	Conv	Church	60	51	..	..	508
St. Rose's Free Home for Incurable Cancer	St. Rose's Free Home for Incurable Cancer	Cancer	Church	91	80	..	..	327
Nagara Falls, 75,460—Nagara	Nagara Falls Municipal Hospital	City	Corp	38	20	..	..	285
Oneonta, 12,576—Otsego	Parshall Private Hospital..	Gen	Corp	34	12	6	75	406
Onondaga, 200—Onondaga	Onondaga County Hospital..	Inst	County	157	177	..	..	565
Oriskany, 1,142—Onondaga	Eastern Star Home and Infirmary	Inst	Fratt	77	75	..	..	..
Ossining, 15,241—Westchester	Greenmont-on-Hudson Sing Sing Prison Hosp..	Ment	Inst	19	10	..	..	..
Orange, 1,601—Chenango	New York State Woman's Relief Corps Home	Inst	State	72	64	..	..	149
Palenville, 200—Greene	St. Joseph's Burgharville Convalescent Home	Conv	Church	66	52	..	..	605
Pawling, 1,204—Dutchess	White Oak Farm	N&M	Corp	19	12	..	..	4
Pelham Manor, 4,608—Westchester	Pelham Manor for Children	Card	NPAasn	20	20	..	..	52
Pleasantville, 4,540—Westchester	Hebrew Sheltering Guardian Orphan Asylum	Inst	NPAasn	25	7	..	..	233
Port Jervis, 10,243—Orange	Deerpark Hospital	Gen	Corp	17	8	4	22	270
Poughkeepsie, 40,288—Dutchess	Poughkeepsie City Home Infirmary	Inst	City	30	24	..	..	125
Yassar College Infirmary	Yassar College Infirmary	Inst	NPAasn	41	8	..	..	1,022
Queens Village, —Queens	Queens Village Sanatorium..	Gen	Indiv	12	5	5	27	58

Key to symbols and abbreviations is on page 1195

NEW YORK—Continued

Related Institutions		Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Rhinebeck, 1,560—Dutchess	Holiday Farm, Home for Convalescent Children	Conv	Indiv	25	22	..	..	..
Rochester, 328,132—Monroe	Convallescent Hospital for Children	Conv	NPAasn	49	42	..	..	..
Field Sanitarium	Field Sanitarium	Conv	Indiv	20	11	..	..	..
Knorr Sanitarium	Knorr Sanitarium	Conv	Indiv	40	35	..	..	..
Rockaway Park, —Queens	Convallescent Home for He-brew Children	OrthConv	NPAasn	112	100	..	..	..
Rome, 32,338—Oneida	Rome State School	MeDe	State	3,764	3,400	24	11	24
Roslyn, 2,900—Nassau	St. Francis Sanatorium for Cardiac Children	Card	Church	50	50	..	..	..
Rye, 8,712—Westchester	Haleyon Rest	N&M	Indiv	43	44	..	..	..
Saranac Lake, 8,020—Franklin	Franklin Manor	Inst	Indiv	15	0	..	..	..
Owens Private Sanatorium	Owens Private Sanatorium	TB	Indiv	20	14	..	..	..
Schenectady, 95,692—Schenectady	Bellevue Maternity Home	Mat	Indiv	19	12	20	40	..
Schenectady City Hospital	Schenectady City Hospital	City	County	63	50	..	..	..
Sea Cliff, 3,456—Nassau	Country Home for Convalescent Babies	Conv	NPAasn	70	63	..	..	..
Staten Island, 158,346—Richmond	New York City Farm Colony	Inst	City	1,152	1,100	..	..	..
Sailors' Saug Harbor Hosp.	Sailors' Saug Harbor Hosp.	Gen	NPAasn	194	162	..	..	..
Seaside Hospital	Seaside Hospital	Chil	NPAasn	107	129	..	..	..
State School, —Orange	Hospital of New York State Training School for Boys	Inst	State	25	17	..	..	..
Syracuse, 209,326—Onondaga	Syracuse State School	MeDe	State	1,166	1,033	..	..	..
Thiells, 320—Rockland	Letchworth Village	MeDe	State	3,763	3,708	..	..	..
Troy, 72,763—Rensselaer	Rensselaer County Hospital	Inst	County	55	40	..	..	..
Troy Orphan Asylum	Troy Orphan Asylum	Inst	NPAasn	25	7	..	..	..
Tupper Lake, 5,271—Franklin	American Legion Mountain Camp	Conv	NPAasn	55	45	..	..	..
Utica, 101,740—Onondaga	Children's Hospital Home	Orth	NPAasn	40	23	..	..	..
Valhalla, 620—Westchester	Blytheedale Hosp. and Home for Crippled Children	Orth	NPAasn	70	57	..	..	..
Valley Cottage, 931—Rockland	Reed Farm and Nichols Cottage	Chil	Card Indiv	24	24	..	..	..
Wallkill, 700—Ulster	Wallkill State Prison Hosp.	Inst	State	20	3	..	..	..
Wassale, 250—Dutchess	Watertown State School	MeDe	State	4,183	4,313	..	..	..
Watertown, 32,205—Jefferson	Jefferson County Home	Inst	County	25	22	..	..	..
White Plains, 35,830—Westchester	Martine Farm Children's Cardiac Home	Card	Indiv	25	25	..	..	..
Williamsburg, 3,119—Erie	Josephine Goodyear Conva-lescent Home	Conv	Chil Indiv	60	55	..	..	..
Woodbourne, 500—Sullivan	Woodbourne Institution for Defective Delinquents	MeDe	State	750	651	..	..	..
Yonkers, 134,646—Westchester	Yonkers City Hospital for Communicable Diseases	City	City	87	12	..	..	..

NORTH CAROLINA

Hospitals and Sanatoriums		Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Albemarle, 3,493—Stanly	Stanly General Hospital	Gen	NPAasn	27	17	8	71	59
Asheboro, 5,021—Randolph	Asheboro Hospital	Gen	NPAasn	26	22	10	109	1,112
Asheville, 59,193—Buncombe	Randolph Hospital	Gen	NPAasn	40	20	6	109	1,000
Asheville Heights Sanitarium	Asheville Heights Sanitarium	TB	Corp	23	14	..	..	..
Asheville Mission Hospital	Asheville Mission Hospital	N&M	Corp	175	61	..	..	..
Asheville Physiatric Institute	Asheville Physiatric Institute	Gen	NPAasn	120	83	16	56	5,774
Aston Park Hospital	Aston Park Hospital	NervConv	Indiv	25	19	..	..	..
St. Joseph's Hospital	St. Joseph's Hospital	Gen	NPAasn	24	23	6	26	1,274
St. Zephyr Hill Sanatorium	St. Zephyr Hill Sanatorium	Gen	NPAasn	25	25	8	5	1,177
Badin, 2,040—Stanly	Badin Hospital	Chil	Indiv	20	23	..	..	..
Badin Hospital	Badin Hospital	Gen	Corp	25	6	4	27	57

NORTH CAROLINA—Continued

REGISTERED HOSPITALS

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NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Lanners Elk, 340—Avery Grace Hospital	Gen	Church	60	42	8	107	1,033
Laufort, 2,957—Carteret Potter Emergency Hospital	Gen	Corp	12	2	4	38	279
Lincolnton, 172—Buncombe Western North Carolina Sanatorium	Gen	NPAssn	20	6	..	..	1,467
Black Mountain, 737—Buncombe Beallmont Park Sanat.	Gen	NPAssn	20	12	..	..	91
Fellowship Sanatorium of the Royal League	TB	Frat	20	12	..	..	10
Sanatorium	TB	State	300	298	..	..	338
Brevard, 2,339—Transylvania Lyday Memorial Hospital	Gen	NPAssn	25	7	2	38	321
Burlington, 9,737—Alamance Alamance General Hospital	Gen	NPAssn	42	26	5	155	1,180
Charlotte, 82,075—Mecklenburg Charlotte Eye, Ear and Throat Hospital	ENT	Part Church	20	13	..	..	1,775
Good Samaritan Hospital	Gen	Church	101	41	12	182	1,707
Mersey Hospital	Gen	Church	125	122	25	796	4,790
New Charlotte Sanatorium	Gen	Corp	100	83	10	12	3,548
Presbyterian Hospital	Gen	Church	150	115	10	428	4,069
St. Peter's Hospital	Gen	Church	66	69	12	316	2,948
Cherokee, 35—Swain Eastern Cherokee Indian Hospital	Gen	IA	28	16	5	80	507
Concord, 11,820—Cabarrus Cabarrus County Hospital	Gen	County	74	73	13	289	3,016
Crossnore, 181—Avery Garrett Memorial Hospital	Gen	NPAssn	20	12	11	80	310
Durham, 52,037—Durham Duke Hospital	Gen	NPAssn	520	358	50	620	11,363
Lincoln Hospital	Gen	NPAssn	99	57	9	175	1,829
McPherson Hospital	Gen	NPAssn	30	10	..	..	925
Watts Hospital	Gen	NPAssn	200	139	25	504	5,442
Elizabeth City, 10,037—Pasquotank Albemarle Hospital	Gen	CyCo	45	25	5	83	608
Elkin, 2,357—Surry Hugh Chatham Memorial Hospital	Gen	Church	70	29	12	99	1,363
Erwin, 4,000—Harnett Good Hope Hospital	Gen	NPAssn	34	8	8	56	308
Fayetteville, 13,049—Cumberland Cumberland County Tuberculosis Sanatorium	TB	County	20	..	..	..	Estab. 1939
Highsmith Hospital	Gen	NPAssn	114	92	6	128	3,171
Pittman Hospital	Gen	NPAssn	88	49	12	104	2,521
Fletcher, 69—Henderson Mountain Sanitarium and Hospital	Gen	Church	50	37	5	74	1,000
Fort Bragg, Cumberland Station Hospital	Gen	Army	115	104	7	86	2,549
Franklin, 1,094—Macon Angel Hospital	Gen	NPAssn	56	26	4	57	1,111
Gastonia, 17,093—Gaston Garrison General Hospital	Gen	NPAssn	45	23	5	134	1,014
Gaston County Negro Hosp.	Gen	County	20	9	2	5	208
North Carolina Orthopedic Hospital	Orth	State	160	161	..	..	441
Goldsboro, 14,985—Wayne State Hospital	Gen	NPAssn	115	56	7	125	1,913
Greensboro, 53,669—Guilford Glenwood Park Sanitarium	N&M	Corp	30	20	..	..	541
Piedmont Memorial Hosp.	Gen	NPAssn	60	42	10	191	1,841
L. Richardson Memorial Hospital	Gen	Church	60	35	6	71	1,247
St. Leo's Hospital	Gen	NPAssn	51	69	9	171	2,333
Sternberger Hospital for Women and Children	Gen	NPAssn	40	29	12	187	856
Wesley Long Hospital	Gen	Corp	65	61	10	213	2,373
Greenville, 9,191—Pitt Hamlet Hospital	Gen	NPAssn	60	31	3	85	1,751
Pitt General Hospital	Gen	NPAssn	46	33	4	58	996
Hamlet Hospital	Gen	Church	35	14	2	45	528
Henderson, 6,345—Yancey Jubilee Hospital	Gen	NPAssn	41	25	6	136	1,064
Marlin Parham Hospital	Gen	NPAssn	35	15	6	73	865
Hendersonville, 5,070—Henderson Patton Memorial Hospital	Gen	NPAssn	30	12	6	60	664
Hickory, 7,363—Catawba Hickory Memorial Hospital	Gen	NPAssn	45	26	8	177	1,202
Richard Baker Hospital	Gen	NPAssn	63	47	7	169	2,160
High Point, 30,745—Guilford Burrus Memorial Hospital	Gen	NPAssn	38	25	5	163	1,518
Guilford General Hospital	Gen	Fed	20	4	4	27	428
Hwassee Dam, —Cherokee Huntersville, 800—Mecklenburg Mecklenburg Sanatorium	TB	County	170	150	..	..	146
Guilford County Sanat.	TB	County	130	125	..	..	150
Kinston, 11,362—Lenoir Memorial General Hospital	Gen	NPAssn	69	41	6	209	2,201
Parrot Memorial Hospital	Gen	NPAssn	40	23	5	197	1,505
Laurinburg, 3,312—Scotland Laurinburg Hospital	Gen	NPAssn	30	20	5	38	516

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Leaksville, 1,814—Rockingham Leaksville General Hosp.	Gen	NPAssn	45	26	5	88	1,429
Lenoir, 6,532—Caldwell Blackwelder Hospital	Gen	NPAssn	27	13	7	117	676
Caldwell Hospital	Gen	NPAssn	25	12	2	35	551
Dula Hospital	Gen	Indiv	20	9	5	23	443
Lexington, 9,652—Davidson Davidson Hospital	Gen	County	20	11	6	51	632
Lincolnton, 3,781—Lincoln Gordon Crowell Memorial Hospital	Gen	Corp	42	21	2	56	1,299
Reeves Hospital	Gen	NPAssn	85	52	6	201	2,484
Lumberton, 4,140—Robeson Baker Sanatorium	Gen	NPAssn	75	65	10	283	3,188
Thompson Memorial Hospital	Gen	NPAssn	30	17	4	125	886
Marion, 2,467—McDowell Marion General Hospital	Gen	NPAssn	10	5	6	111	1,821
Mocksville, 1,503—Davie Mocksville Hospital	Gen	NPAssn	43	22	6	76	880
Monroe, 6,100—Union Ellen Fitzgerald Hospital	Gen	NPAssn	59	50	8	245	2,297
Mooreville, 5,619—Iredell Lowrance Hospital	Gen	City	28	12	3	85	508
Morehead City, 3,483—Carteret Morehead City Hospital	Gen	Part Church	75	44	..	..	137
Morganton, 6,001—Burke Broadnocks Sanatorium	N&M	State	82	49	18	321	2,832
Grace Hospital	Gen	NPAssn	2,324	2,294	..	..	543
State Hospital	Gen	Indiv	44	38	6	45	1,002
Mt. Airy, 6,045—Surry Martin Memorial Hospital	Gen	County	25	11	5	41	569
Murphy, 1,612—Cherokee Petrie Hospital	Gen	NPAssn	30	..	..	..	Estab. 1939
Nashville, 1,137—Nash R. R. Gay Nash County Tuberculosis Sanatorium	TB	County	35	15	3	50	893
New Bern, 11,981—Craven St. Luke's Hospital	Gen	NPAssn	36	19	6	95	900
Newton, 4,394—Catawba Catawba General Hospital	Gen	Corp	51	27	6	90	1,350
North Wilkesboro, 3,608—Wilkes Wilkes Hospital	Gen	NPAssn	29	13	4	39	522
Oteen, 504—Buncombe Veterans Admin. Facility	GenTb Vet	NPAssn	14	8	1	15	271
Oxford, 4,101—Granville Granville Hospital	Gen	NPAssn	65	45	10	121	1,548
Susie Clayton Cheatham Memorial Hospital	Gen	NPAssn	29	13	4	39	522
Pinehurst, 55—Moore Moore County Hospital	Gen	NPAssn	14	8	1	15	271
Raleigh, 37,379—Wake Central Prison Hospital	Gen	State	125	88	..	..	1,859
Mary Elizabeth Hospital	Gen	Corp	36	28	9	163	1,293
Rex Hospital	Gen	NPAssn	174	119	26	461	5,099
Royster Medical Center	Unit of State Hospital	Church	90	69	10	170	1,524
St. Agnes Hospital	Gen	State	2,258	2,170	..	..	901
Wake County Tuberculosis Sanatorium	TB	CyCo	24	25	..	..	41
Reidsville, 6,851—Rockingham Memorial Hospital	Gen	NPAssn	43	31	6	179	1,500
Roanoke Rapids, 3,404—Halifax Roanoke Rapids Hospital	Gen	NPAssn	82	70	13	274	3,161
Rocky Mount, 21,412—Nash Atlantic Coast Line Hosp.	Indus	NPAssn	50	30	..	..	703
Park View Hospital	Gen	NPAssn	110	71	10	173	2,589
Rocky Mount Sanitarium	Gen	NPAssn	90	43	6	114	1,433
Speight-Stone-Bunn Clinic Hospital	Gen	Part	10	3	4	147	390
Roseboro, 768—Sampson Brewer-Stirling Clinic	Gen	Part	10	2	2	27	166
Roxboro, 3,657—Person Community Hospital	Gen	NPAssn	25	14	4	51	818
Rutherfordon, 2,020—Rutherford Rutherford Hospital	Gen	NPAssn	60	33	2	25	1,933
Salisbury, 16,951—Rowan Rowan Memorial Hospital	Gen	NPAssn	110	64	12	222	2,617
Sanatorium, 57—Hoke North Carolina Sanatorium for the Treatment of Tuberculosis	TB	State	630	535	..	..	696
Sanford, 4,253—Lee Lee County Hospital	Gen	County	47	28	8	87	1,508
Shelby, 10,789—Cleveland Shelby Hospital	Gen	CyCo	65	50	10	267	2,003
Siler City, 1,730—Chatham Chatham Hospital	Gen	NPAssn	17	8	4	50	500
Smithfield, 2,543—Johnston Johnston County Hospital	Gen	NPAssn	35	18	10	39	527
Southern Pines, 2,534—Moore Pine-Crest Manor Sanat.	TB	Indiv	43	19	..	..	61
Southport, 1,760—Brunswick J. Arthur Doshier Memorial Hospital	Gen	CyCo	45	17	4	67	607
Statesville, 10,420—Iredell Davis Hospital	Gen	NPAssn	130	97	12	167	3,718
H. F. Long Hospital	Gen	NPAssn	65	47	6	96	1,839

Key to symbols and abbreviations is on page 1195

NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Sylva, 1,340—Jackson C. J. Harris Community Hospital	Gen	NPassn	26	10	3	26	337
Tabor City, 1,165—Columbus Williams Clinic Hospital....	Gen	Indiv	20	5	4	66	303
Tarboro, 6,379—Edgecombe Bass Memorial Hospital....	Gen	Indiv	8	4	5	14	112
Edgecombe General Hosp.▲	Gen	NPassn	44	23	6	78	1,009
Thomasville, 10,090—Davidson City Memorial Hospital....	Gen	NPassn	32	21	3	99	808
Tryon, 1,670—Polk St. Luke's Hospital.....	Gen	NPassn	29	13	6	76	673
Valdese, 1,816—Burke Valdese General Hospital... Gen	Gen	NPassn	27	...	6	Estab.	1939
Wadesboro, 3,124—Anson Anson Sanatorium.....	Gen	NPassn	50	35	8	88	1,278
Washington, 7,035—Beaufort Tayloe Hospital▲	Gen	NPassn	69	37	6	210	1,707
Waynesville, 2,414—Haywood Haywood County Hospital. Gen	County		75	57	10	267	2,061
Whiteville, 2,203—Columbus Columbus County Hospital. Gen	Gen	NPassn	50	19	8	119	1,179
Williamston, 2,731—Martin Brown Community Hospital Gen	Gen	Corp	14	...	6	Estab.	1939
Wilmington, 32,270—New Hanover Bulluck Hospital▲	Gen	Indiv	32	10	3	32	538
Community Hospital.....	Gen	CyCo	40	29	10	182	1,179
James Walker Memorial Hospital▲	Gen	NPassn	177	150	20	882	6,432
Wilmington Tuberculosis Sanitarium.....	TB	NPassn	40	38	...	...	32
Wilson, 12,613—Wilson Carolina General Hospital▲ Gen	Gen	NPassn	50	27	8	150	1,307
Woodard-Herring Hospital▲ Gen	Gen	NPassn	72	36	6	133	1,783
Winston-Salem, 75,274—Forsyth City Hospital▲	Gen	City	315	216	30	732	7,518
City Memorial Hospital.....	White	Division of City Hospital					
Forsyth County Hospital....	Gen	County	116	114	...	...	116
Forsyth County Sanat.▲	TB	County	168	116	...	...	77
Kate Bittling Reynolds Memorial Hospital.....	Colored	Division of City Hospital					
North Carolina Baptist Hospital	Gen	Church	92	90	16	527	4,099
Wrightsville Sound, 23—New Hanover Babies Hospital.....	Chil	NPassn	35	18	...	...	233
Related Institutions							
Asheboro, 5,021—Randolph Barnes and Griffin Clinic....	Gen	Part	10	6	2	49	463
Asheville, 50,193—Buncombe Asheville Orthopedic Home....	Orth	NPassn	25	...	...	Estab.	1939
Pisgah Sanitarium and Hospital.....	Gen	Church	30	9	3	24	322
Sunset Heights.....	TB	Corp	16	12	...	...	39
Violet Hill Sanatorium.....	TB	Indiv	37	33	...	...	68
Charlotte, 82,675—Mecklenburg Florence Crittenton Industrial Home.....	Mat	NPassn	40	3	4	29	35
Davidson, 1,445—Mecklenburg Davidson College Infirmary. Inst	Inst	NPassn	25	3	...	...	175
Fayetteville, 13,049—Cumberland Fayetteville Eye, Ear, Nose and Throat Hospital.....	ENT	Part	12	3	...	...	536
Goldshoro, 14,955—Wayne Whispering Cedars Rest Home.....	Conv	Indiv	10	4	...	...	355
Hallfax, 321—Hallifax Halifax County Tuberculosis Sanitarium.....	TB	County	23	20	...	...	25
Henderson, 6,345—Vance Scott Parker Sanatorium....	TB	County	14	10	...	...	14
Kinston, 11,262—Lenoir Caswell Training School....	MeDe	State	845	744	...	...	71
Monroe, 6,100—Union Quality Hill Sanitarium....	Gen	Indiv	18	2	4	8	110
New Bern, 11,931—Craven Good Shepherd Hospital....	Gen	Church	40	14	4	19	425
North Wilkesboro, 3,663—Wilkes Wilkes County Tuberculosis Hut.....	TB	County	14	8	...	...	19
Pinebluff, 259—Moore Pinebluff Sanitarium.....	N&M	Indiv	42	25	...	...	131
Raleigh, 37,379—Wake McCauley Private Hospital. Gen	Gen	Indiv	10	3	2	9	112
North Carolina State School for the Blind and Deaf....	Inst	State	26	3	...	...	90
Saluda, 558—Polk Infants and Children's Sanit. Chil	Chil	Indiv	55	25	...	...	165
Spartanburg Baby Hospital Chil	Chil	NPassn	35	27	...	...	153
Tarboro, 6,379—Edgecombe Edgecombe County Tuberculosis Sanitarium.....	TB	County	23	21	...	...	75
Thomasville, 19,000—Davidson Mills Home Infirmary.....	Inst	Church	25	6	...	...	599
Wilson, 12,613—Wilson Mercy Hospital.....	Gen	CyCo	55	21	2	21	506

NORTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ambrose, 334—Divide Lutheran Good Samaritan Hospital.....	Gen	Church	15	6	4	43	57
Belcourt, 205—Rquette Turtle Mountain Hospital... Gen	Gen	IA	50	33	10	129	53
Bismarck, 11,090—Burleigh Bismarck Hospital▲	Gen	Church	128	81	12	181	572
St. Alexis Hospital▲	Gen	Church	144	93	12	267	547
Bottineau, 1,322—Bottineau St. Andrew's Hospital.....	Gen	Church	75	56	12	235	157
Carrington, 1,717—Foster Carrington Hospital.....	Gen	NPassn	18	8	6	60	57
Carson, 356—Grant Carson Hospital.....	Gen	Indiv	14	4	6	53	13
Devils Lake, 5,451—Ramsey General Hospital▲	Gen	NPassn	50	33	8	81	254
Mercy Hospital▲	Gen	Church	100	50	26	200	1,071
Dickinson, 5,025—Stark St. Joseph's Hospital▲	Gen	Church	86	41	14	191	1,238
Drayton, 502—Pembina Drayton Hospital.....	Gen	Indiv	13	11	4	31	41
Fargo, 28,619—Cass St. John's Hospital▲	Gen	Church	155	115	20	535	5,791
St. Luke's Hospital▲	Gen	Church	108	74	17	233	257
Veterans Admin. Facility▲	Gen	Vet	184	94	...	...	1,065
Fort Lincoln (Bismarck P.O.), —Burleigh Station Hospital.....	Gen	Army	65	32	...	...	54
Fort Totten, 125—Benson Fort Totten Hospital.....	Gen	IA	37	14	4	41	66
Fort Yates, 800—Sioux Standing Rock Indian Hosp. Gen	Gen	IA	50	17	5	59	64
Grafton, 3,136—Walsh Grafton Deaconess Hosp.▲	Gen	Church	50	42	10	316	1,285
Grand Forks, 17,112—Grand Forks Grand Forks Deaconess Hospital▲	Gen	NPassn	85	59	20	337	2,531
St. Michael's Hospital▲	Gen	Church	63	52	15	333	2,266
Harvey, 2,157—Wells St. Aloisius Hospital.....	Gen	Church	30	14	7	120	79
Jamestown, 8,157—Stutsman North Dakota State Hospital for Insane▲	Ment	State	2,182	1,887	...	...	473
Trinity Hospital▲	Gen	Church	77	40	12	149	1,621
Kenmare, 1,494—Ward Kenmare Deaconess Hospital Gen	Gen	Church	45	14	5	56	58
Langdon, 1,221—Cavalier Mercy Hospital.....	Gen	Church	35	...	12	Estab.	1929
Linton, 1,192—Emmons Linton Hospital.....	Gen	Indiv	8	4	5	49	157
Mandan, 5,037—Morton Mandan Deaconess Hospital Gen	Gen	Church	41	30	8	156	1,681
McVie, 513—Nelson Community Hospital.....	Gen	Corp	16	8	4	65	347
Minot, 16,099—Ward McManne's Private Hospital ENT	ENT	Indiv	13	7	...	...	201
St. Joseph's Hospital▲	Gen	Church	110	68	15	235	2,673
Trinity Hospital▲	Gen	Church	170	103	18	311	3,611
New Rockford, 2,195—Eddy City Hospital.....	Gen	Church	35	8	5	31	291
Northwood, 971—Grand Forks Northwood Deaconess Hosp. Gen	Gen	NPassn	25	13	4	32	47
Oakes, 1,709—Dickey Mercy Hospital.....	Gen	Church	25	8	16	71	419
Rolette, 428—Rolette Community Hospital.....	Gen	NPassn	15	8	4	57	273
Rugby, 1,612—Pierce Good Samaritan Hospital▲	Gen	Church	60	50	12	265	2,994
San Haven, —Rolette North Dakota State Tuberculosis Sanitarium+	TB	State	368	305	...	...	3
Valley City, 5,263—Barnes Mercy Hospital▲	Gen	Church	100	54	14	181	1,676
Wahpeton, 3,176—Richland Wahpeton Hospital.....	Gen	Part	26	15	5	65	474
Williston, 5,106—Williams Good Samaritan Hospital▲	Gen	Church	39	20	11	167	1,191
Mercy Hospital▲	Gen	Church	100	29	12	116	1,613
Related Institutions							
Bismarck, 11,090—Burleigh North Dakota State Penitentiary Hospital.....	Inst	State	35	11	...	...	507
Bowman, 888—Bowman Bowman Hospital.....	Gen	Indiv	9	3	6	31	158
Elkhounds, 123—McLean Fort Berthold Indian Hosp. Gen	Gen	IA	25	11	5	41	233
Elgin, 505—Grant Elgin Hospital.....	Gen	Indiv	10	5	4	23	129
Fargo, 28,619—Cass Camp Maternity Hospital... Mat	Mat	Indiv	15	2	12	41	41
Cass County Hospital.....	Gen	County	29	16	4	59	57
Florence Crittenton Home....	Mat	NPassn	55	29	6	54	...
Grafton, 3,136—Walsh Grafton State School.....	MeDe	State	1,107	853	...	...	174
Grand Forks, 17,112—Grand Forks Grand Forks City Hospital. Iso	Iso	City	16	1	...	...	25
Jamestown, 8,157—Stutsman Isolation Hospital.....	Iso	CyCo	10	...	...	...	71
Jamestown Hospital.....	Gen	NPassn	44	22	6	51	1,101
Mayville, 1,139—Traill Union Hospital.....	Gen	NPassn	12	6	6	70	260

Key to symbols and abbreviations is on page 1195

OHIO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Akron, 255,040—Summit							
Children's Hospital*+⊙	Chil	NPassn	110	88	..	...	3,469
City Hospital*+⊙	Gen	NPassn	324	272	41	1,796	11,662
Edwin Shaw Sanatorium*+⊙	TB	County	204	193	..	...	217
Peoples Hospital*+⊙	Gen	NPassn	156	95	20	736	4,511
St. Thomas Hospital*+⊙	Gen	Church	148	115	27	738	5,481
Alliance, 23,047—Stark							
Alliance City Hospital⊙	Gen	City	85	44	15	369	1,555
Amherst, 2,844—Lorain							
Pleasant View Sanatorium..	TB	County	96	93	..	...	65
Ashland, 11,141—Ashland							
Samaritan Hospital⊙	Gen	NPassn	30	26	12	307	1,318
Ashtabula, 23,301—Ashtabula							
Ashtabula General Hosp.⊙	Gen	NPassn	77	34	8	250	3,101
Athens, 7,252—Athens							
Athens State Hospital	Ment	State	1,604 ¹	1,729	..	...	332
Sheltering Arms Hospital...	Gen	Indiv	40	18	8	91	741
Barberton, 23,934—Summit							
Citizens Hospital⊙	Gen	Corp	57	27	18	341	1,333
Bedford, 6,814—Cuyahoga							
Bedford Municipal Hospital Gen	City		27	16	9	127	607
Bellaire, 13,327—Belmont							
City Hospital⊙	Gen	NPassn	45	22	5	200	907
Bellevue, 6,256—Huron							
Bellevue Hospital	Gen	NPassn	20	12	8	86	489
Berea, 5,697—Cuyahoga							
Community Hospital	Gen	NPassn	32	24	9	193	925
Bryan, 4,689—Williams							
Cameron Hospitals	Gen	NPassn	16	9	5	69	388
Bucyrus, 10,027—Crawford							
Bucyrus City Hospital	Gen	City	38	21	6	131	822
Cambridge, 14,613—Guernsey							
St. Francis Hospital	Gen	Indiv	25	7	3	44	455
Canton, 104,906—Stark							
Aultman Hospital*+⊙	Gen	NPassn	147	89	24	693	2,610
Little Flower Hospital	Unit of Mercy Hospital						
Mercy Hospital*+⊙	Gen	Church	202	153	33	1,141	6,247
Molly Stark Sanatorium	TB	County	166	141	..	2	234
Celina, 4,664—Mercer							
Otis Hospital	Gen	Indiv	26	10	4	75	472
Chillicothe Hospital	Gen	NPassn	56	34	6	171	915
U. S. Industrial Reformatory	Inst	Fed	73	34	..	...	1,321
Veterans Admin. Facility	Ment	Vet	1,553	1,174	..	...	420
Cincinnati, 451,100—Hamilton							
Bethesda Hospital*+⊙	Gen	Church	239	179	40	995	6,581
Children's Hospital*+⊙	Chil	Church	216	128	..	...	4,214
Christ Hospital*+⊙	Gen	Church	317	250	54	973	8,332
Christian R. Holmes Hosp.	Gen	City	52	34	..	...	1,110
Cincinnati General Hosp.*+⊙	Gen	City	907	718	65	2,302	15,979
Cincinnati Sanitarium	N&M	Corp	75	64	..	...	214
Deaconess Hospital*+⊙	Gen	Church	175	111	25	593	4,700
Good Samaritan Hosp.*+⊙	Gen	Church	550	330	65	1,511	11,102
Hamilton County Tubercu-							
losis Hospital*+⊙	TB	County	640	583	..	...	543
Jewish Hospital*+⊙	Gen	NPassn	225	152	37	748	5,895
Longview State Hospital*+⊙	Ment	State	2,711 ¹	2,609	..	...	584
Ohio Hospital for Women							
and Children	Unit of Bethesda Hospital						
St. Mary Hospital*+⊙	Gen	Church	193	147	30	536	4,635
Circleville, 7,369—Pickaway							
Berger Hospital	Gen	City	25	10	6	108	560
Cleveland, 900,429—Cuyahoga							
Babies and Childrens Hosp...	Unit of University Hospitals						
City Hospital*+⊙	Gen	City	1,550	1,205	50	1,535	14,034
City Psychopathic Hospital.	Unit of City Hospital						
Cleveland Clinic Foundation							
Hospital*+⊙	Gen	NPassn	238	159	..	...	5,924
Cleveland State Hospital*+⊙	Ment	State	2,285 ¹	2,280	..	...	557
East 55th Street Hospital...	Gen	Corp	26	8	12	4	172
Evangelical Deaconess Hos-							
pital*+⊙	Gen	Church	144	128	35	775	4,062
Fairview Park Hospital*+⊙	Gen	Church	83	75	18	525	3,679
Glenville Hospital*+⊙	Gen	NPassn	88	87	22	509	3,791
Grace Hospital*+⊙	Gen	NPassn	68	27	12	117	1,291
John H. Lowman Memorial							
Pavilion	Unit of City Hospital						
Lakeside Hospital	Unit of University Hospitals						
Leonard C. Hanna House	Unit of University Hospitals						
Lutheran Hospital*+⊙	Gen	Church	109	91	28	764	4,413
Maternity Hospital	Unit of University Hospitals						
Mt. Sinai Hospital*+⊙	Gen	NPassn	225	189	45	780	8,638
Polyclinic Hospital	Gen	NPassn	90	85	15	355	2,542
Prospect Hospital	N&M	Corp	200	206	..	...	18
St. Alexis Hospital*+⊙	Gen	Church	220	160	..	...	5,281
St. Ann's Maternity Hos-							
pital*+⊙	Mat	Church	62	43	56	1,555	1,097
St. John's Hospital*+⊙	Gen	Church	220	184	32	932	6,804
St. Luke's Hospital*+⊙	Gen	Church	336	292	55	1,452	12,421
St. Vincent Charity Hos-							
pital*+⊙	Gen	Church	295	232	..	...	6,317
U. S. Marine Hospital	Gen	USPHS	303	241	..	...	3,273
University Hospitals*+⊙	Gen	NPassn	683	553	124	2,217	20,151
Woman's Hospital*+⊙	Gen	NPassn	110	77	17	382	2,635

OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Columbus, 290,564—Franklin							
Children's Hospital*+⊙	Chil	NPassn	132	85	..	...	2,586
Columbus State Hospital*+⊙	Ment	State	2,534 ¹	2,585	..	...	629
Franklin County Sanat.*+⊙	TB	County	375	234	..	3	296
Dr. Gaver Sanitarium	N&M	Indiv	25	15	..	...	120
Grant Hospital*+⊙	Gen	NPassn	273	172	30	947	6,129
McMillen Sanitarium	N&M	Corp	35	23	..	...	285
Mercy Hospital*+⊙	Gen	NPassn	65	50	15	103	931
Mt. Carmel Hospital*+⊙	Gen	Church	200	150	25	708	5,779
St. Ann's Asylum and Ma-							
ternity Hospital*+⊙	Mat	Church	25	16	23	625	650
St. Anthony Hospital	Gen	Church	206	184	..	...	1,074
St. Clair Hospital	Gen	NPassn	30	6	4	13	320
St. Francis Hospital*+⊙	Gen	State	160	117	..	...	3,072
Starling-Loving University							
Hospital*+⊙	Gen	State	264	194	32	683	6,029
Station Hospital*+⊙	Gen	Army	200	125	3	31	2,075
White Cross Hospital*+⊙	Gen	Church	243	198	28	1,030	6,981
Conneaut, 9,691—Ashtabula							
Brown Memorial Hospital	Gen	NPassn	30	19	8	141	845
Coshocton, 10,905—Coshocton							
Coshocton City Hospital⊙	Gen	City	44	...	No data supplied		
Crestline, 4,425—Crawford							
Crestline Emergency Hosp...	Gen	NPassn	10	7	4	44	275
Cuyahoga Falls, 19,797—Summit							
Fair Oaks Villa	N&M	NPassn	85	58	..	...	179
Dayton, 200,982—Montgomery							
Dayton State Hospital	Ment	State	1,756 ¹	1,714	..	...	536
Good Samaritan Hosp.*+⊙	Gen	Church	235	189	48	1,065	4,857
Miami Valley Hospital*+⊙	Gen	NPassn	400	319	44	1,381	10,749
St. Ann's Maternity Hospital	Unit of St. Elizabeth Hospital						
St. Elizabeth Hospital*+⊙	Gen	Church	365	235	33	1,506	8,020
Stillwater Sanatorium	TB	Counties	170	93	..	...	90
Defiance, 8,818—Defiance							
Defiance Hospital	Gen	NPassn	35	22	10	221	955
Dennison, 4,523—Tuscarawas							
Twin City Hospital	Gen	NPassn	28	10	5	72	413
Dover, 9,710—Tuscarawas							
Union Hospital*+⊙	Gen	NPassn	75	35	10	167	1,138
East Cleveland, 39,667—Cuyahoga							
Huron Road Hospital*+⊙	Gen	NPassn	211	200	45	1,071	8,371
East Liverpool, 23,329—Columbiana							
East Liverpool City Hosp.*+⊙	Gen	City	85	64	15	384	2,478
Elyria, 25,633—Lorain							
Elyria Memorial Hosp.*+⊙	Gen	NPassn	200	70	19	632	2,843
Gates Hospital for Crip-							
pled Children	Unit of Elyria Memorial Hospital						
Findlay, 19,363—Hancock							
Findlay Hospital	Gen	NPassn	64	35	12	334	1,597
Freemont, 13,422—Sandusky							
Community Hospital	Gen	NPassn	14	8	4	41	317
Memorial Hospital of San-							
dusky County	Gen	NPassn	54	36	12	379	1,466
Gallion, 7,674—Crawford							
Good Samaritan Hospital	Gen	NPassn	12	7	6	125	535
Gallipolis, 7,106—Gallia							
Holzer Hospital*+⊙	Gen	Part	54	38	4	73	1,966
Ohio Hospital for Epileptics	Gen	State	1,991 ¹	2,097	..	...	252
Green Springs, 750—Seneca and Sandusky							
Oak Ridge Sanatorium	TB	Indiv	75	58	..	...	86
Greenville, 7,036—Darke							
Wayne Hospital	Gen	NPassn	34	19	6	117	972
Hamilton, 52,176—Butler							
Fort Hamilton Hospital	Gen	NPassn	85	41	24	325	1,425
Mercy Hospital*+⊙	Gen	Church	200	103	40	600	3,240
Hillsboro, 4,040—Highland							
Hillsboro Hospital	Gen	NPassn	14	10	4	82	560
Ironton, 16,621—Lawrence							
Charles S. Gray Deaconess							
Hospital	Gen	NPassn	25	...	5	...	Reopened
Lawrence County Gen. Hosp.	Gen	County	72	34	12	281	1,456
Marling Hospital	Gen	NPassn	25	14	5	45	583
Kenton, 7,069—Hardin							
McKirtick Hospital	Gen	NPassn	25	23	5	81	714
San Antonio Hospital	Gen	Church	21	15	5	42	297
Lacarne, 200—Ottawa							
Station Hospital	Gen	Army	20	3	..	...	170
Lakewood, 70,509—Cuyahoga							
Lakewood Hospital	Gen	City	67	43	16	349	3,375
Lima, 42,257—Allen							
District Tuberculosis Hosp.	TB	Counties	124	92	..	...	125
Lima Memorial Hospital*+⊙	Gen	NPassn	120	82	24	489	3,746
Lima State Hospital	Ment	State	1,076 ¹	1,161	..	...	163
St. Rita's Hospital*+⊙	Gen	Church	101	65	10	337	2,355
Lodi, 1,273—Medina							
Lodi Hospital	Gen	NPassn	30	9	9	173	850
Logan, 6,080—Hocking							
Cherrington Hospital	Gen	NPassn	35	11	5	42	377
Lorain, 44,512—Lorain							
St. Joseph's Hospital	Gen	Church	100	67	20	558	3,170
Macedonia, 734—Summit							
Hawthornden Farm	Unit of Cleveland State Hospital						
Mansfield, 33,525—Richland							
Mansfield General Hosp.*+⊙	Gen	NPassn	150	85	28	705	4,051
Marletta, 14,283—Washington							
Marletta Memorial Hospital	Gen	NPassn	54	30	10	186	1,244
Marion, 31,084—Marion							
Marion City Hospital	Gen	City	50	31	11	207	1,592
Sawyer Sanatorium	N&M	Part	50	24	..	...	121

OHIO—Continued

Key to symbols and abbreviations is on page 1195

OHIO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Lancaster, 18,716—Fairfield Boys' Industrial School	Inst	State	100	21	..	..	875
Lebanon, 3,222—Warren Blair Brothers Hospital	Gen	Part	8	5	3	51	299
Marysville, 3,639—Union Harmon Hospital	Inst	State	34	6	3	4	176
Mt. Vernon, 9,370—Knox Avalon Sanatorium	TB	Indiv	95	62	..	..	92
Munroe Falls, 302—Summit Summit County Hospital	Inst	County	175	175	..	..	331
Napoleon, 4,545—Henry S. M. Heller Memorial Hosp.	Gen	City	14	8	4	46	423
New London, 1,527—Huron New London Hospital	Gen	NPAasn	9	6	3	39	265
Orient, 255—Pickaway Institution for Feeble-minded McDe	State	State	2,750†	2,711	..	..	243
Oxford, 2,588—Butler Miami University Student Hospital	Inst	State	40	10	..	..	1,090
Reynoldsburg, 502—Franklin Nightingale Cottage	TbChil	NPAasn	40	28	..	..	30
Springfield, 68,743—Clark Ohio Rebekah Hospital	Inst	Frat	75	45	..	..	215
Rickly Memorial Hospital	Inst	Frat	280	245	..	..	178
State Soldiers Home, —Eric Ohio Soldiers and Sailors Home Hospital	Inst	State	200	87	..	..	507
Tiffin, 16,428—Seneca Kentucky Memorial Hospital	Inst	Frat	50	13	..	..	871
Toledo, 290,718—Lucas Lucas County Hosp. Annex. Chr	County	County	112	112	..	..	119
Municipal Hospital for Contagious Diseases	Iso	City	28	7	..	..	226
Toledo Society for Crippled Children	Orth	NPAasn	70	54	..	..	95
W. pital	Inst	City	170	161	..	..	289
Wickliffe, 2,491—Lake Ridge-Cliff Sanitarium	N&M	Corp	90	59	..	..	15
Wooster, 10,742—Wayne Hygeia Hall	Inst	NPAasn	25	3	..	..	396
Xenia, 10,507—Greene Ohio Soldiers' and Sailors' Orphans' Home Hospital	Inst	State	63	32	..	..	1,450
Yellow Springs, 1,427—Greene Antioch College Infirmary	Inst	NPAasn	10	5	..	..	495
Youngstown, 170,002—Mahoning Youngstown Municipal Hosp.	Iso	City	60	1	..	..	35

OKLAHOMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Ada, 11,261—Pontotoc Breco's Memorial Hospital	Gen	NPAasn	25	10	2	49	565
Valley View Hospital	Gen	NPAasn	51	33	9	241	1,693
Altus, 8,439—Jackson City Hospital	Gen	City	30	4	4	35	200
Alva, 5,121—Woods Alva General Hospital	Gen	City	30	18	4	131	904
Anadarko, 5,036—Caddo Anadarko Hospital	Gen	Part	20	10	3	54	572
Ardmore, 15,741—Carter Hardy Sanitarium	Gen	Indiv	45	23	8	169	1,110
Von Keller Hosp. and Clinic	Gen	NPAasn	28	7	6	26	303
Bartlesville, 14,763—Washington Washington County Memorial Hospital	Gen	County	55	26	10	249	1,231
Beaver, 1,028—Beaver Beaver Hospital	Gen	Part	17	6	3	36	440
Blackwell, 9,521—Kay Blackwell Hospital	Gen	Corp	38	5	5	32	199
Riverside Clinic Hospital	Gen	Part	15	11	5	123	474
Bristow, 6,619—Creek Cowart-Sisler Hospital	Gen	Corp	19	6	5	39	415
Carmegie, 2,063—Caddo Carnegie Hospital and Clinic	Gen	Corp	13	5	5	79	272
Cherokee, 2,236—Alfalfa Masonic Hospital	Gen	Frat	51	22	7	80	696
Chickasha, 14,009—Grady Chickasha Hospital	Gen	Part	54	25	4	68	1,028
Cottage Hospital	Gen	Indiv	10	8	5	48	486
General Hospital	Gen	NPAasn	22	6	5	66	835
Claremore, 3,729—Rogers Claremore Indian Hospital	Gen	IA	56	74	16	198	1,426
Clinton, 7,512—Custer Clinton Indian Hospital	Gen	IA	33	15	5	39	421
Western Oklahoma Charity Hospital	Gen	State	135	114	6	78	2,413
Western Oklahoma Tuberculosis Sanatorium	TB	State	300	278	..	..	352

OKLAHOMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Concho, 290—Canadian Cheyenne and Arapaho Hospital	Gen	IA	46	23	8	59	730
Cordell, 2,936—Washita Florence Hospital	Gen	Indiv	30	3	7	42	159
Cushing, 9,301—Payne Masonic Hospital	Gen	Frat	30	19	6	136	920
Duncan, 8,333—Stephens Patterson Hospital	Gen	Indiv	25	10	6	62	620
Weedn Hospital	Gen	Indiv	60	12	8	50	548
Durant, 7,463—Bryan Durant Hospital	Gen	Corp	25	12	3	56	610
Evergreen Sanitarium	Gen	Indiv	21	7	2	33	246
Haynie-Coker Hospital	Gen	Part	11	12	2	44	422
Elk City, 5,667—Beckham Tisdal Hospital	Gen	Indiv	35	7	3	45	450
El Reno, 9,384—Canadian Catto Hospital	Gen	Indiv	19	6	3	34	184
El Reno Sanitarium	Gen	Indiv	36	16	8	101	699
Enid, 26,399—Garfield Enid General Hospital	Gen	NPAasn	90	54	10	129	1,730
Independence Hospital	Gen	NPAasn	16	9	4	59	416
St. Mary's Enid Springs Hospital	Gen	Church	41	24	9	231	1,687
University Hospital Foundation	Gen	NPAasn	75	30	15	184	1,633
Erick, 2,231—Beckham Stagner Clinic and Hospital	Gen	Indiv	12	5	2	Reopened	
Fort Sill, 5,587—Comanche Station Hospital	Gen	Army	386	288	10	182	5,529
Frederick, 4,568—Tillman Frederick Clinic Hospital	Gen	Part	30	8	3	86	512
Frederick Clinic Hospital	Gen	Corp	10	4	4	94	209
Gen	Gen	Indiv	12	5	2	75	120
Hos. pital	Gen	NPAasn	85	13	5	81	685
Duke Sanitarium	N&M	Corp	25	16	..	..	100
Henryetta, 7,694—Okmulgee Henryetta Hospital	Gen	Indiv	25	15	2	48	604
John Taylor Hospital	Gen	Indiv	14	..	..	No data supplied	
Hobart, 4,982—Kiowa General Hospital	Gen	Part	21	9	5	224	953
Holdenville, 7,268—Hughes Holdenville Hospital	Gen	Indiv	30	12	3	10	557
Hollis, 2,914—Harmon Hollis Hospital	Gen	Indiv	15	7	3	55	594
Hominy, 3,465—Osage Hominy Hospital	Gen	Indiv	28	4	4	41	215
Lawton, 12,121—Comanche Kiowa Indian Hospital	Gen	IA	140	112	16	188	2,126
Southwestern Clinic Hosp.	Gen	Corp	31	7	4	40	350
Mangum, 4,866—Greer Border Hospital and Clinic	Gen	Indiv	26	15	6	26	846
Marlow, 3,084—Stephens Weedn Hospital	Gen	Indiv	20	3	4	12	157
Maud, 4,326—Seminole Maud Hospital	Gen	Indiv	18	7	2	39	272
McAlester, 11,604—Pittsburg Albert Pike Hospital	Gen	Indiv	63	27	6	59	1,368
Central Oklahoma State Hospital Annex	MeDe	State	250†	230	..	Estab. 1939	
St. Mary's Infirmary	Gen	Church	20	8	5	50	487
Miami, 8,064—Ottawa Miami Baptist Hospital	Gen	Church	40	16	7	89	867
Muskogee, 32,026—Muskogee Muskogee Provident Hosp.	Gen	CyCo	15	6	1	10	237
Oklahoma Baptist Hosp.	Gen	Church	114	43	11	272	1,854
Veterans Admin. Facility	Gen	Yet	423	353	..	..	3,369
Norman, 9,602—Cleveland Central Oklahoma State Hospital	Ment	State	2,600†	2,602	..	..	1,063
Okemah, 4,002—Okfuskee Clinic Hospital	Gen	Indiv	8	3	2	68	286
Oklahoma City, 185,389—Oklahoma Bone and Joint Hospital and McBride Clinic	Orth	Corp	41	22	..	..	597
Coyne Campbell Clinic and Sanitarium	N&M	Part	25	..	..	Estab. 1939	
Great Western Hospital	Gen	Corp	35	16	2	11	258
Moorman's Farm Sanat.	TB	Indiv	25	13	..	..	92
Oklahoma City General Hospital	Gen	Corp	88	76	12	239	3,569
Polyclinic Hospital	Gen	Indiv	95	40	8	225	1,076
St. Anthony Hospital	Gen	Church	330	264	50	1,593	10,207
Samaritan Hospital	Gen	Indiv	41	20	8	151	913
State Hospital	Gen	State	450	417	18	458	6,522
W. ..	Gen	Part	135	80	25	660	4,217
Okmulgee, 17,097—Okmulgee Okmulgee City Hospital	Gen	City	37	17	6	133	966
Paula Valley, 4,235—Garvin Ladies-Johnson Shirley Hospital	Gen	Part	20	13	6	160	589
Pawhuska, 5,631—Osage Osage County Hospital	Gen	County	40	14	3	84	477
Pawhuska Municipal Hosp.	Gen	City	40	10	4	69	470

OKLAHOMA—Continued

REGISTERED HOSPITALS

Jozz A. J. A.
March 22, 1934

Hospitals and Sanatoriums

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Pawnee, 2,562—Pawnee	Gen	IA	48	30	6	95	799
Pawnee-Ponca Hospital	Gen	Indiv	40	5	3	3	241
Picher, 7,773—Ottawa	Gen	Part	17	9	2	28	572
American Hospital	Gen	Church	50	44	12	335	2,489
Ponca City, 16,136—Ray	Gen	Indiv	15	15	2	50	275
Ponca City Hospital	Gen	Part	10	4	3	34	245
Poteau, 3,163—Le Flore	Gen	Corp	25	4	4	50	276
Woodson Hospital	Gen	Indiv	21	14	4	183	845
Prague, 1,220—Lincoln	Gen	Part	28	11	6	129	1,120
Rollins Hospital	Gen	IA	150	112	6	201	1,509
Sayre, 3,157—Beckham	Gen	City	133	122	..	97	963
Seminoe, 11,439—Seminole	Gen	State	20	5	4	..	648
Shattuck Hospital	Gen	IA	700	676	..	..	238
Shattuck, 1,490—Ellis	Gen	Part	68	48	14	171	1,072
Shawnee, 23,283—Pottawatomie	Gen	State	235	150	14	131	1,483
A. O. H. Hospital	Gen	Indiv	370	350	..	..	360
Shawnee Indian Sanat.	Gen	NPAssn	14	2	4	40	152
Sulphur, 4,242—Murray	Gen	Corp	163	24	..	..	1,537
Sulphur Tubercular Sanat.	Gen	Corp	42	102	25	507	3,763
Sulphur Clinic	Gen	Church	214	140	36	814	6,277
Supply, 230—Woodward	Gen	State	14	2,498	..	..	446
Western Oklahoma Hospital	Gen	Corp	25	12	4	25	303
Taft, 690—Muskogee	Gen	Indiv	20	6	4	41	278
State Hospital for Negro In-	Gen	Indiv	35	7	5	110	534
sane	Gen	Indiv	..	..	..	..	..
Tahlequah, 2,495—Cherokee	Gen	IA	5	3	1	25	101
Wm. W. Hastings Indian	Gen	Fed	47	2	1	1	95
Hospital	Gen	State	66	27	..	..	766
Tahlequah, 1,032—Le Flore	Gen	Indiv	11	3	3	32	235
Choctaw-Chickasaw Sana-	Gen	Corp	12	1	..	..	18
torium and Hospital	Gen	Part	28	16	6	122	970
Eastern Oklahoma State Tu-	Gen	State	20	7	5	62	321
berculosis Sanatorium	Gen	Indiv	40	23	..	..	843
Tonkawa, 3,311—Kay	Gen	Part	9	3	2	40	222
Tonkawa Hospital	Gen	Church	12	3	2	17	212
Tulsa, 141,255—Tulsa	Gen	State	22	10	30	224	266
Flower Hospital for Crippled	Gen	IA	50	9	..	..	1,313
Children	Gen	County	19	5	..	..	296
Morningside Hospital	Gen	Corp	42	27	5	63	621
Oakwood Sanitarium	Gen	NPAssn	75	35	10	52	1,023
St. John's Hospital	Gen	Indiv	..	..	..	..	..
Vinita, 4,263—Craig	Gen	Corp	..	..	..	..	..
Eastern Oklahoma Hospital	Gen	Corp	..	..	..	..	..
Vinita Hospital	Gen	Corp	..	..	..	..	..
Waurika, 2,368—Jefferson	Gen	Corp	..	..	..	..	..
Waurika Hospital	Gen	Corp	..	..	..	..	..
Wewoka, 10,401—Seminole	Gen	Corp	..	..	..	..	..
Wewoka Hospital	Gen	Corp	..	..	..	..	..
Woodward, 5,036—Woodward	Gen	Corp	..	..	..	..	..
Woodward General Hosp.	Gen	Indiv	..	..	..	..	..

Related Institutions

Chelsea, 1,527—Rogers	Gen	Indiv	..	..	..	..	..
Jennings Hospital	Gen	IA	5	3	1	25	101
Chillico, 200—Kay	Gen	Fed	47	2	1	1	95
Chillico Indian Sch. Hosp.	Gen	State	66	27	..	..	766
El Reno, 9,384—Canadian	Gen	Indiv	11	3	3	32	235
Federal Reformatory	Gen	Corp	12	1	..	..	18
Enid, 26,330—Garfield	Gen	Part	28	16	6	122	970
Northern Oklahoma Hosp.	Gen	State	20	7	5	62	321
Fairfax, 2,134—Osage	Gen	Indiv	40	23	..	..	843
Fairfax Hospital	Gen	Part	9	3	2	40	222
Station Hospital (El Reno P.O.)	Gen	Church	12	3	2	17	212
Hobart, 4,382—Kiowa	Gen	State	22	10	30	224	266
Hobart Hospital	Gen	IA	50	9	..	..	1,313
Lawton, 12,121—Comanche	Gen	County	19	5	..	..	296
Angus Hospital	Gen	Corp	42	27	5	63	621
McAlester, 11,804—Pittsburg	Gen	NPAssn	75	35	10	52	1,023
Oklahoma State Prison Hos-	Gen	Indiv	..	..	..	..	..
pital	Gen	Indiv	..	..	..	..	..
Okeene, 1,635—Blaine	Gen	Part	..	..	..	..	..
Okeene Hospital	Gen	Corp	..	..	..	..	..
Okemah, 4,002—Okfuskee	Gen	Corp	..	..	..	..	..
Okemah Hospital	Gen	Corp	..	..	..	..	..
Oklahoma City, 183,329—Oklahoma	Gen	Corp	..	..	..	..	..
Home of Redeeming Love	Gen	Corp	..	..	..	..	..
Stillwater, 7,016—Payne	Gen	Corp	..	..	..	..	..
Agriculture and Mechanical	Gen	Corp	..	..	..	..	..
College Infirmary	Gen	Corp	..	..	..	..	..
Tahlequah, 2,495—Cherokee	Gen	Corp	..	..	..	..	..
Sequoiah Training School	Gen	Corp	..	..	..	..	..
Hospital	Gen	Corp	..	..	..	..	..
Tulsa, 141,255—Tulsa	Gen	Corp	..	..	..	..	..
Municipal Hospital No. 2	Gen	Corp	..	..	..	..	..
Tulsa General Hospital	Gen	Corp	..	..	..	..	..
Tulsa Junior League Home	Gen	Corp	..	..	..	..	..
for Convalescent Crippled	Gen	Corp	..	..	..	..	..
Children	Gen	Corp	..	..	..	..	..
Watonga, 2,225—Blaine	Gen	Corp	..	..	..	..	..
Watonga Hospital	Gen	Corp	..	..	..	..	..

Key to symbols and abbreviations is on page 1195

OREGON

Hospitals and Sanatoriums

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Albany, 5,325—Linn	Gen	NPAssn	50	21	8	103	77
Albany General Hospital	Gen	Part	21	6	7	102	57
Ashland, 4,544—Jackson	Gen	Church	91	49	13	158	154
Community Hospital	Gen	Church	115	37	15	108	124
Astoria, 10,349—Clatsop	Gen	Church	80	50	12	212	27
Columbia Hospital	Gen	Church	45	29	6	217	177
St. Mary's Hospital	Gen	NPAssn	18	8	4	55	40
Baker, 7,858—Baker	Gen	Corp	38	17	6	172	67
St. Elizabeth Hospital	Gen	Corp	29	13	4	41	57
Bend, 8,848—Deschutes	Gen	Part	15	5	3	25	27
St. Charles Hospital	Gen	Church	70	41	8	193	157
Burns, 2,599—Harney	Gen	Church	115	74	19	69	123
Valley View Hospital	Gen	County	50	25	12	130	94
Corvallis, 7,585—Benton	Gen	NPAssn	36	22	5	60	125
Corvallis General Hospital	Gen	IA	27	15	5	49	73
Dallas, 2,975—Polk	Gen	Corp	54	40	12	273	177
Dallas Hospital	Gen	Corp	40	35	14	40	150
Enterprise, 1,370—Wallowa	Gen	Church	55	27	14	131	59
Enterprise Hospital	Gen	NPAssn	26	15	6	135	24
Eugene, 18,901—Lane	Gen	Corp	50	..	10	Established	132
Sacred Heart Hospital and Clinic	Gen	Corp	40	27	7	113	145
Grants Pass, 4,666—Josephine	Gen	Church	75	50	8	149	145
Josephine County General	Gen	NPAssn	52	28	..	..	15
Hospital	Gen	Indiv	44	21	6	26	67
Hood River, 2,757—Hood River	Gen	Corp	20	7	4	73	67
Hood River Hospital	Gen	Corp	60	40	7	45	142
Klamath Agency, 150—Klamath	Gen	Church	35	26	5	69	9
Klamath Indian Hospital	Gen	Indiv	31	12	7	137	6
Klamath Falls, 16,093—Klamath	Gen	Corp	33	41	10	212	163
Hillside Hospital	Gen	State	1,350	1,223	..	..	27
Klamath Valley Hospital	Gen	Corp	70	55	12	212	140
La Grande, 8,050—Union	Gen	Corp	100	33	..	..	125
St. Joseph Hospital	Gen	Church	263	234	60	1,007	962
Lebanon, 1,851—Linn	Gen	NPAssn	325	230	34	721	577
Marshall, 5,287—Coos	Gen	Corp	50	20	10	119	53
McAuley Hospital	Gen	Church	320	75	6	20	27
McMinnville, 2,917—Yamhill	Gen	Indiv	25	13	..	..	1
Medford, 11,007—Jackson	Gen	Corp	57	24	..	..	1
Sacred Heart Hospital	Gen	Church	124	65	29	704	577
Milwaukie, 1,767—Clackamas	Gen	Church	356	337	36	571	194
Portland Open Air Sanat.	Gen	Corp	50	53	..	..	24
Myrtle Point, 1,363—Coos	Gen	NPAssn	..	..	..	..	..
Mast Hospital	Gen	Indiv	..	..	..	..	..
Newberg, 2,931—Yamhill	Gen	Corp	..	..	..	..	..
Willamette Hospital	Gen	Corp	..	..	..	..	..
North Bend, 4,012—Coos	Gen	Corp	..	..	..	..	..
Kelzer Brothers Hospital	Gen	Corp	..	..	..	..	..
Ontario, 1,941—Malheur	Gen	Corp	..	..	..	..	..
Holy Rosary Hospital	Gen	Church	..	..	..	..	..
Oregon City, 5,761—Clackamas	Gen	Indiv	..	..	..	..	..
Hutchinson General Hosp.	Gen	Corp	..	..	..	..	..
Oregon City Hospital	Gen	Corp	..	..	..	..	..
Pendleton, 6,621—Umatilla	Gen	State	..	..	..	..	..
Eastern Oregon State Hosp.	Gen	Church	..	..	..	..	..
St. Anthony's Hospital	Gen	Corp	..	..	..	..	..
Portland, 301,815—Multnomah	Gen	Corp	..	..	..	..	..
Coffey Memorial Hospital	Gen	Corp	..	..	..	..	..
Doernbecher Memorial Hosp.	Gen	Corp	..	..	..	..	..
for Children	Gen	Corp	..	..	..	..	..
Emanuel Hospital	Gen	Corp	..	..	..	..	..
Good Samaritan Hosp.	Gen	Corp	..	..	..	..	..
Hahnemann Hospital	Gen	Corp	..	..	..	..	..
Juvenile Hospital for Girls	Gen	Corp	..	..	..	..	..
Morningside Hospital	Gen	Corp	..	..	..	..	..
Multnomah Hospital	Gen	Corp	..	..	..	..	..
Portland Convalescent Hosp.	Gen	Corp	..	..	..	..	..
Portland Medical Hospital	Gen	Corp	..	..	..	..	..
Portland Sanitarium and	Gen	Corp	..	..	..	..	..
Hospital	Gen	Corp	..	..	..	..	..
St. Vincent's Hospital	Gen	Corp	..	..	..	..	..
Shriners Hospital for Crip-	Gen	Corp	..	..	..	..	..
pled Children	Gen	Corp	..	..	..	..	..
Theo. B. Wilcox Memorial	Gen	Corp	..	..	..	..	..
Hospital	Gen	Corp	..	..	..	..	..
University of Oregon Medical	Gen	Corp	..	..	..	..	..
School Hospitals and	Gen	Corp	..	..	..	..	..
Clinics	Gen	Corp	..	..	..	..	..
Veterans Admin. Facility	Gen	Corp	..	..	..	..	..
Waverleigh Sanatorium	Gen	Corp	..	..	..	..	..
Prineville, 1,027—Crook	Gen	Corp	..	..	..	..	..
Prineville General Hospital	Gen	Corp	..	..	..	..	..
Roseburg, 4,362—Douglas	Gen	Corp	..	..	..	..	..
Mercury Hospital	Gen	Corp	..	..	..	..	..
Veterans Admin. Facility	Gen	Corp	..	..	..	..	..
St. Helens, 3,604—Columbia	Gen	Corp	..	..	..	..	..
St. Helens General Hospital	Gen	Corp	..	..	..	..	..
Salem, 25,266—Marion	Gen	Corp	..	..	..	..	..
Oregon State Hospital	Gen	Corp	..	..	..	..	..
Oregon State Tuberculosis	Gen	Corp	..	..	..	..	..
Hospital	Gen	Corp	..	..	..	..	..
Salem Deaconess Hospital	Gen	Corp	..	..	..	..	..
Salem General Hospital	Gen	Corp	..	..	..	..	..
Silverton, 2,422—Marion	Gen	Corp	..	..	..	..	..
Silverton Hospital	Gen	Corp	..	..	..	..	..

OREGON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
The Dalles, 5,883—Wasco							
Eastern Oregon State Tuberculosis Hospital..... TB	State	Indiv	200	191	..	...	133
Mid-Columbia Hospital..... Gen	Indiv	Indiv	22	13	6	33	593
The Dalles Hospital..... Gen	Corp	Corp	75	36	8	173	1,566
Tillamook, 2,540—Tillamook							
Chariton Hospital..... Gen	Indiv	Indiv	35	11	8	60	520
Toledo, 2,137—Lincoln							
Lincoln Hospital..... Gen	Part	Part	25	14	4	100	502
Troutdale, 227—Multnomah							
Multnomah County Tuberculosis Pavilion..... TB	County	County	41	39	..	...	97
Warm Springs, 50—Jefferson							
Warm Springs Hospital.... Gen	IA	IA	23	11	6	19	294
Related Institutions							
Chemawa, 700—Marion							
Salem Indian School Hosp.. Gen	IA	IA	60	29	3	12	811
Coquille, 7,732—Coos							
Coquille Hospital..... Gen	Part	Part	29	15	8	86	635
Corvallis, 7,583—Benton							
Student Health Service Oregon State College..... Inst	State	State	30	14	..	...	767
Lakeview, 1,799—Lake							
Lakeview Hospital..... Gen	Corp	Corp	16	7	4	60	435
Portland, 301,815—Multnomah							
E. Henry Wemme White Shield..... Mat	NPAasn	NPAasn	22	11	12	33	52
Isolation Hospital..... Iso	City	City	100	18	..	...	341
Salvation Army White Shield Home..... Mat	Church	Church	30	27	7	72	115
Prairie City, 433—Grant							
Grant County Hospital.... Gen	Indiv	Indiv	13	6	4	27	225
Salem, 26,266—Marion							
Oregon Fairview Home..... McDe	State	State	1,097 ¹	1,001	..	...	151
Oregon State Penitentiary Hospital..... Inst	State	State	32	23	..	...	300
Oregon State School for the Deaf..... Inst	State	State	10	1	..	...	208
Waldport, 367—Lincoln							
Waldport Community Hosp. Gen	Indiv	Indiv	10	3	4	42	84

PENNSYLVANIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Abington, 3,200—Montgomery							
Abington Memorial Hospital*+*o..... Gen	NPAasn	NPAasn	254	195	51	759	6,532
Allentown, 92,563—Lehigh							
Allentown Hospital*+*o..... Gen	NPAasn	NPAasn	350	292	35	743	8,518
Allentown State Hosp.*+*o..... Ment	State	State	1,660 ¹	1,623	..	...	370
Baer Hospital..... Gen	Indiv	Indiv	20	8	10	67	234
Sacred Heart Hospital*+*o..... Gen	Church	Church	300	199	25	843	5,200
Allenwood, 400—Union							
Devitt's Camp..... TB	NPAasn	NPAasn	102	82	..	...	156
Altoona, 82,054—Blair							
Altoona Hospital*+*o..... Gen	NPAasn	NPAasn	162	92	18	460	3,399
Mercy Hospital*+*a..... Gen	Church	Church	148	80	32	491	3,494
Ambler, 3,944—Montgomery							
Dufur Hospital..... N&M	Indiv	Indiv	50	50	..	...	90
Ashland, 7,164—Schuylkill							
Ashland State Hospital*o..... Gen	State	State	150	142	25	467	4,621
Asplinn (Sharpsburg P.O.), 4,263—Allegheny							
Veterans Admin. Facility*+*a..... Gen	Vet	Vet	750	479	..	...	2,942
Beaver Falls, 17,147—Beaver							
Providence Hospital*+*a..... Gen	Church	Church	52	48	10	236	1,412
Bedford, 2,953—Bedford							
Timmins' Hospital..... Gen	Indiv	Indiv	18	8	4	22	270
Bellefonte, 4,804—Centre							
Centre County Hospital..... Gen	NPAasn	NPAasn	53	46	16	313	1,026
Bellevue, 10,252—Allegheny							
Suburban General Hosp.*+*o..... Gen	NPAasn	NPAasn	104	56	14	318	2,063
Berwick, 12,660—Columbia							
Berwick Hospital..... Gen	NPAasn	NPAasn	50	30	10	189	1,287
Bethlehem, 57,892—Northampton							
St. Luke's Hospital*+*a*o..... Gen	NPAasn	NPAasn	193	150	23	506	4,651
Bloomsburg, 9,093—Columbia							
Bloomsburg Hospital*+*o..... Gen	NPAasn	NPAasn	117	74	18	344	2,399
Blossburg, 1,606—Tioga							
Blossburg State Hospital*+*a..... Gen	State	State	90	87	9	257	2,281
Bradford, 19,329—Allegheny							
Bradford General Hosp.*+*o..... Gen	NPAasn	NPAasn	121	80	16	638	3,253
Bradford, 19,306—McKean							
Bradford Hospital*+*a..... Gen	NPAasn	NPAasn	115	67	20	394	2,219
Bristol, 11,779—Bucks							
Dr. Wagner's Private Hosp. Gen	Indiv	Indiv	20	10	8	114	310
Brookville, 4,387—Jefferson							
Brookville Hospital..... Gen	NPAasn	NPAasn	36	29	6	66	824
Brownsville, 2,823—Fayette							
Brownsville General Hosp.*+*o..... Gen	NPAasn	NPAasn	90	47	10	183	1,533
Bryn Mawr, 10,206—Montgomery							
Bryn Mawr Hospital*+*a*o..... Gen	Corp	Corp	234	153	30	616	5,112
Butler, 23,568—Butler							
Butler County Memorial Hospital*+*o..... Gen	NPAasn	NPAasn	99	69	15	337	2,772

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Canonsburg, 12,558—Washington							
Canonsburg General Hosp.*+*o Gen	NPAasn	NPAasn	72	45	18	356	1,670
Carbondale, 20,061—Lackawanna							
Carbondale General Hosp.*+*a Gen	NPAasn	NPAasn	68	43	12	218	1,572
St. Joseph's Hospital*+*a..... Gen	Church	Church	88	42	10	169	1,567
Carlisle, 12,596—Cumberland							
Carlisle Hospital*+*a..... Gen	NPAasn	NPAasn	77	50	18	326	1,999
Station Hospital..... Gen	Army	Army	50	46	2	29	733
Chambersburg, 13,788—Franklin							
Chambersburg Hospital..... Gen	NPAasn	NPAasn	90	50	12	199	1,552
Chester, 59,164—Delaware							
Chester Hospital*+*a*o..... Gen	NPAasn	NPAasn	215	142	35	719	4,737
J. Lewis Crozer Home for Incurables and Homeopathic Hospital*+*a..... Gen	Corp	Corp	78	30	21	341	1,577
Clarks Summit, 2,604—Lackawanna							
Hillside Home and Hospital for Mental Diseases..... Ment	County	County	950	880	..	...	271
Clearfield, 9,221—Clearfield							
Clearfield Hospital*+*a..... Gen	NPAasn	NPAasn	108	75	18	281	2,821
Clifton Heights, 5,057—Delaware							
Burn Brae Hospital..... N&M	Indiv	Indiv	45	35	..	...	81
Coaldale, 6,921—Schuylkill							
Coaldale State Hospital..... Gen	State	State	104	86	18	327	2,442
Coatesville, 14,582—Chester							
Clement Atkinson Memorial Hospital..... Gen	Indiv	Indiv	20	7	3	43	159
Coatesville Hospital*+*o..... Gen	NPAasn	NPAasn	88	63	10	287	1,831
Veterans Admin. Facility*+*a..... Ment	Vet	Vet	1,459	1,475	..	...	299
Columbia, 11,349—Lancaster							
Columbia Hospital..... Gen	NPAasn	NPAasn	45	21	11	118	626
Confluence, 989—Somerset							
Frantz Hospital..... Gen	Indiv	Indiv	12	6	3	9	182
Connellsville, 13,290—Fayette							
Connellsville State Hospital*+*a Gen	State	State	83	64	15	402	1,977
Corry, 7,152—Erie							
Corry Hospital..... Gen	NPAasn	NPAasn	40	16	8	217	1,039
Coudersport, 2,740—Potter							
Coudersport General Hosp.. Gen	NPAasn	NPAasn	30	15	4	58	380
Danville, 7,185—Montour							
Danville State Hospital*+*a*o Ment	State	State	1,947 ¹	1,974	..	...	495
Geo. F. Geisinger Memorial Hospital*+*a*o..... Gen	NPAasn	NPAasn	154	122	20	473	5,604
Darby, 9,899—Delaware							
Fitzgerald-Mercy Hospital*+*a Gen	Church	Church	200	140	48	956	3,975
Dixmont, 188—Allegheny							
Dixmont Hospital..... N&M	NPAasn	NPAasn	1,000	1,149	..	...	257
Doylestown, 4,577—Bucks							
Dr. Buckman's Sanitarium..... N&M	Indiv	Indiv	35	14	..	...	100
Drexel Hill, 1,119—Delaware							
Delaware County Hospital*+*a Gen	NPAasn	NPAasn	56	55	14	329	1,950
Du Bois, 11,595—Clearfield							
Du Bois Hospital*+*a..... Gen	Church	Church	50	26	7	181	1,114
Maple Avenue Hospital..... Gen	NPAasn	NPAasn	73	30	7	145	1,350
Eagleview, 250—Montgomery							
Eagleview Sanatorium for Consumptives*+*o..... TB	NPAasn	NPAasn	188	172	..	...	173
Easton, 34,468—Northampton							
Betts Hospital..... Gen	NPAasn	NPAasn	40	24	10	221	1,054
Easton Hospital*+*a*o..... Gen	NPAasn	NPAasn	199	137	21	513	4,882
Easton Sanitarium..... N&M	Indiv	Indiv	30	16	..	...	46
East Stroudsburg, 6,099—Monroe							
General Hospital of Monroe County..... Gen	NPAasn	NPAasn	47	36	12	171	1,359
Elizabethtown, 3,940—Lancaster							
Philadelphia Freemasons' Memorial Hospital..... Gen	Frat	Frat	165	151	..	...	651
State Hospital for Crippled Children*+*a..... Orth	State	State	125	128	..	...	185
Ellwood City, 12,323—Lawrence							
Ellwood City Hospital..... Gen	NPAasn	NPAasn	52	32	18	244	967
Erie, 115,967—Erie							
Erie County Tuberculosis Hospital..... TB	County	County	65	62	..	...	62
Hamat Hospital*+*a*o..... Gen	NPAasn	NPAasn	224	172	31	994	6,431
St. Vincent's Hospital*+*a*o..... Gen	NPAasn	NPAasn	260	160	70	890	6,701
Zem Zem Hospital for Crippled Children..... Orth	Frat	Frat	48	35	..	...	45
Everett, 1,874—Bedford							
Everett Hospital..... Gen	Indiv	Indiv	25	9	5	39	423
Franklin, 10,254—Venango							
Franklin Hospital..... Gen	NPAasn	NPAasn	62	30	10	154	1,297
Gettysburg, 5,584—Adams							
Annie M. Warner Hospital*+*a Gen	NPAasn	NPAasn	56	33	9	200	1,317
Gladwyne, 1,236—Montgomery							
Gladwyne Colony..... N&M	Indiv	Indiv	82	79	..	...	102
Greensburg, 16,508—Westmoreland							
Westmoreland Hospital*+*o..... Gen	NPAasn	NPAasn	155	105	20	679	3,840
Greenville, 8,628—Mercer							
Greenville Hospital..... Gen	NPAasn	NPAasn	51	28	12	152	1,323
Grove City, 6,156—Mercer							
Grove City Hospital..... Gen	NPAasn	NPAasn	26	10	6	72	574
Hamburg, 3,637—Berks							
Hamburg State Sanatorium for Tuberculosis..... TB	State	State	540	450	..	...	626
Hanover, 11,803—York							
Hanover General Hospital*+*a Gen	NPAasn	NPAasn	55	39	10	334	1,516
Harrisburg, 80,339—Dauphin							
Harrisburg Hospital*+*a*o..... Gen	NPAasn	NPAasn	229	199	25	833	7,075

Key to symbols and abbreviations is on page 1195

PENNSYLVANIA—Continued

HOSPITALS

JOUR. A. M. A.
MARCH 30, 1935

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions			Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions			
Harrisburg Polyclinic Hospital	Gen	NPAssn	160	113	32	567	4,091			Norristown, 35,853—Montgomery	Gen	NPAssn	130	91	30	47	137			
Harrisburg State Hospital	Gen	State	2,171	2,067	15	120	371			Montgomery Hospital	Gen	NPAssn	3,823	3,583	...	...	...
Keystone Hospital	Gen	State	27	15	6	...	506			Norristown State Hospital	Gen	NPAssn	33	18	10	...	...	
Hazleton, 36,765—Luzerne	Gen	Part	18	10	15	349	593			Sacred Heart Hospital	Gen	NPAssn	43	34	21	29	...			
Corrigan Maternity Hospital	Gen	State	141	134	14	520	4,800			Northampton, 9,839—Northampton	Gen	NPAssn	32	20	3	20	...			
Hazleton State Hospital	Gen	County	375	336	...	...	163			Haff Hospital	Gen	NPAssn	50	15	...	...	...
Holidaysburg, 5,969—Blair	Gen	Corp	125	67	25	363	2,072			Old City, 22,075—Venango	Gen	Indiv	32	20	3	20	...			
Blair County Hospital for Mental Diseases	Gen	NPAssn	32	16	7	84	608			Oil City General Hospital	Gen	NPAssn	90	60	20	416	...			
Homestead, 20,141—Allegheny	Gen	NPAssn	75	55	14	390	2,140			Palmerton, 7,678—Carbon	Gen	NPAssn	65	56	7	173	154			
Homestead Hospital	Gen	NPAssn	170	107	20	223	3,007			Peckville, 8,000—Lackawanna	Gen	NPAssn	62	48	8	23	153			
Honesdale, 5,490—Wayne	Gen	NPAssn	32	13	10	96	606			Philadelphia, 1,950,931—Philadelphia	Gen	NPAssn	...	...	...	...	...
Wayne County Memorial Hospital	Gen	NPAssn	312	252	33	763	6,583			American Hospital for Diseases of the Stomach	Gen	NPAssn	39	15	3	61	...			
Huntingdon, 7,558—Huntingdon	Gen	NPAssn	54	45	19	252	1,481			Anderson Hospital	Gen	NPAssn	50	26	...	...	...
J. C. Blair Memorial Hospital	Gen	NPAssn	18	10	18	185	240			Broad Street Hospital	Gen	NPAssn	75	20	21	23	173			
Indiana, 9,569—Indiana	Gen	NPAssn	104	75	23	440	2,194			Chestnut Hill Hospital	Gen	NPAssn	80	38	30	35	17			
Indiana Hospital	Gen	NPAssn	23	44	12	142	1,387			Children's Heart Hospital	Gen	NPAssn	80	54	25	34	18			
Jersey Shore, 5,781—Luzerne	Gen	NPAssn	67	87	12	471	3,045			Children's Hospital	Gen	NPAssn	60	53	...	...	...
Community Hospital	Gen	NPAssn	67	41	10	203	1,512			Mary J. Drexel Home	Gen	NPAssn	134	90	...	...	...
Johnstown, 66,933—Cambria	Gen	NPAssn	232	175	45	885	6,417			Fairmount Farm	Gen	NPAssn	50	20	...	...	...
Conemaugh Valley Memorial Hospital	Gen	NPAssn	200	131	32	459	4,493			Frankford Hospital	Gen	NPAssn	40	23	...	...	...
Lee Homeopathic Hospital	Gen	NPAssn	23	17	12	118	589			Frederick Douglass Memorial Hospital	Gen	NPAssn	144	98	48	793	475			
Mendenhall Maternity Hospital	Gen	NPAssn	76	51	16	361	1,742			Friends Hospital	Gen	NPAssn	190	141	41	130	...			
Mercy Hospital	Gen	NPAssn	120	71	19	366	2,540			Germantown Hospital	Gen	NPAssn	176	136	...	...	...
Kane, 6,232—McKean	Gen	NPAssn	30	20	6	120	623			Germantown Dispensary and Hospital	Gen	NPAssn	340	287	56	1,137	738			
Community Hospital	Gen	NPAssn	100	101	...	...	132			Graduate Hospital of the University of Pennsylvania	Gen	NPAssn	461	220	...	...	...
Kane Summit Hospital	Gen	NPAssn	25	16	8	138	505			Hahnemann Hospital	Gen	NPAssn	515	400	77	1,432	1,247			
Kane County Hospital	Gen	NPAssn	84	57	...	...	1,603			Hospital of the Protestant Episcopal Church	Gen	Church	104	91	...	...	...
Armstrong County Hospital	Gen	NPAssn	85	74	11	281	2,428			Hospital of the University of Pennsylvania	Gen	Church	482	321	48	1,235	821			
Lancaster, 59,949—Lancaster	Gen	NPAssn	68	48	16	297	1,644			Medical College of the Woman's Hospital	Gen	State	487	342	41	83	11,230			
Lancaster General Hospital	Gen	NPAssn	21	9	4	32	277			Institute of the Pennsylvania Hospital	Gen	NPAssn	152	82	21	62	3,000			
St. Joseph's Hospital	Gen	NPAssn	93	64	20	364	2,026			Jeane's Hospital	Gen	NPAssn	60	37	...	...	...
Lansdale, 5,379—Montgomery	Gen	NPAssn	1,530	1,117	6	6	1,154			Jefferson Medical College	Gen	NPAssn	68	53	...	...	...
Elm Terrace Hospital	Gen	NPAssn	250	177	40	1,077	5,700			Joseph Price Memorial Hospital	Gen	NPAssn	688	515	57	1,221	1,112			
Latrobe, 10,644—Westmoreland	Gen	NPAssn	99	68	20	347	2,830			Kensington Hospital for Women	Gen	NPAssn	475	254	70	1,274	877			
Lebanon, 25,531—Lebanon	Gen	NPAssn	27	8	4	25	325			Lankenau Hospital	Gen	NPAssn	55	15	5	16	43			
Lebanon Sanatorium	Gen	NPAssn	46	27	4	65	917			Lying-In Hospital	Gen	NPAssn	60	44	35	208	2,340			
Leetsdale, 2,774—Allegheny	Gen	NPAssn	44	33	...	...	130			Memorial Hospital	Gen	NPAssn	202	185	39	430	4,430		
Crippled Children Home for Lewisburg, 3,308—Union	Gen	NPAssn	14	4	5	24	230			Mercy Hospital	Gen	NPAssn	82	62	19	277	1,905			
Evangelical Hospital	Gen	NPAssn	10	2	3	33	108			Methodist Hospital	Gen	NPAssn	100	69	10	214	1,841			
U. S. Public Health Service Hospital	Gen	NPAssn	62	61	...	...	81			Misericordia Hospital	Gen	NPAssn	168	115	40	673	4,250		
Lewistown, 13,357—Mifflin	Gen	NPAssn	91	64	18	330	2,125			Mt. Sinai Hospital	Gen	NPAssn	194	130	30	755	4,571			
Lewistown Hospital	Gen	NPAssn	99	68	20	347	2,830			National Stomach Hospital	Gen	NPAssn	261	225	53	1,061	7,311			
Lock Haven, 9,068—Clinton	Gen	NPAssn	27	8	4	25	325			Northeastern Hospital	Gen	NPAssn	43	9	7	21	40			
Lock Haven Hospital	Gen	NPAssn	46	27	4	65	917			Northern Liberties Hospital	Gen	NPAssn	102	76	15	273	2,770			
Teah Private Hospital	Gen	NPAssn	44	33	...	...	130			Northern Liberties Hospital	Gen	NPAssn	68	41	9	93	1,672		
Lock No. 4, 618—Washington	Gen	NPAssn	14	4	5	24	230			Pennsylvania Hospital, Unit of Temple University Hospital	Gen	NPAssn	430	321	120	2,121	8,828			
Charlestown-Mohessen Hospital	Gen	NPAssn	62	61	...	...	81			Philadelphia General Hospital	Gen	NPAssn	225	176	...	...	...
Mayview, 420—Allegheny	Gen	NPAssn	15	4	...	...	409			Philadelphia Hospital for Contagious Diseases	Gen	City	2,076	1,684	60	1,306	2,377		
Pittsburgh City Home and Hospitals	Gen	NPAssn	72	31	8	130	865			Philadelphia Italian Hospital	Gen	City	1,000	158	...	...	...
Pittsburgh City Home and Hospitals	Gen	NPAssn	62	61	...	...	81			Philadelphia Orthopaedic Hospital and Infirmary	Gen	City	42	2	12	15	...		
McKeesport, 61,632—Allegheny	Gen	NPAssn	14	4	5	24	230			Philadelphia State Hospital	Gen	NPAssn	141	53	...	...	...
McKeesport Hospital	Gen	NPAssn	44	33	...	...	130			Presbyterian Hospital	Gen	NPAssn	314	153	42	515	5,774		
McKees Rocks, 18,116—Allegheny	Gen	NPAssn	27	8	4	25	325			Rush Hospital for Consumption and Allied Diseases	Gen	NPAssn	50	23	35	287	...			
Ohio Valley General Hospital	Gen	NPAssn	14	4	5	24	230			St. Agnes Hospital	Gen	NPAssn	155	100	...	...	...
Meadville, 16,688—Crawford	Gen	NPAssn	10	2	3	33	108			St. Christopher's Hospital for Children	Gen	NPAssn	316	212	60	1,061	4,600			
Meadville City Hospital	Gen	NPAssn	62	61	...	...	81			St. Joseph's Hospital	Gen	NPAssn	82	59	...	...	...
Spencer Hospital	Gen	NPAssn	14	4	5	24	230			St. Luke's and Children's Hospital	Gen	NPAssn	162	101	22	410	2,520			
Media, 5,372—Delaware	Gen	NPAssn	14	4	5	24	230			St. Vincent's Hospital	Gen	NPAssn	219	123	40	571	4,882			
Media Hospital	Gen	NPAssn	10	2	3	33	108			Shriners Hospital for Crippled Children	Gen	Church	205	124	41	724	4,760			
Mercer, 2,125—Mercer	Gen	NPAssn	62	61	...	...	81			Stetson Hospital	Gen	NPAssn	100	102	...	...	...
Mercer Cottage Hospital	Gen	NPAssn	44	33	...	...	130												
Mercer Sanatorium	Gen	NPAssn	14	4	5	24	230													
Meyersdale, 3,065—Somerset	Gen	NPAssn	10	2	3	33	108													
Hazel McGilvery Hospital	Gen	NPAssn	62	61	81													
Meyersdale Wenzel Hospital	Gen	NPAssn	14	4	5	24	230													
Monaca, 4,641—Beaver	Gen	NPAssn	10	2	3	33	108													
Beaver County Sanatorium	Gen	NPAssn	62	61	81													
Monessen, 20,238—Westmoreland	Gen	NPAssn	14	4	5	24	230													
Gemmill Hospital	Gen	NPAssn	10	2	3	33	108													
Monongahela, 8,675—Washington	Gen	NPAssn	62	61	81													
Memorial Hospital	Gen	NPAssn	14	4	5	24	230													
Mt. Pleasant, 5,800—Westmoreland	Gen	NPAssn	62	61	81													
Henry Clay Frick Memorial Hospital	Gen	NPAssn	14	4	5	24	230													
Nanticoke, 26,043—Luzerne	Gen	NPAssn	62	61	81													
Nanticoke State Hospital	Gen	NPAssn	14	4	5	24	230													
New Brighton, 9,970—Beaver	Gen	NPAssn	62	61	81													
Beaver Valley General Hospital	Gen	NPAssn	14	4	5	24	230													
New Castle, 45,674—Lawrence	Gen	NPAssn	62	61	81													
Jameson Memorial Hospital	Gen	NPAssn	14	4	5	24	230													
New Castle Hospital	Gen	NPAssn	62	61	81													
New Kensington, 16,762—Westmoreland	Gen	NPAssn	14	4	5	24	230													
Citizens General Hospital	Gen	NPAssn	62	61	81													

Key to symbols and abbreviations is on page 1195

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Temple University Hospital*+ao	Gen	NPAssn	396	330	41	1,060	9,951
U. S. Naval Hospital*+ao	Gen	Navy	650	691	..	..	7,271
Urologic Clinic	Urol	Part	15	5	..	..	240
Wills Hospital*+ao	Eye	NPAssn	200	114	..	..	3,450
Woman's Hospital*+ao	Gen	NPAssn	109	60	41	807	3,605
Women's Homeopathic Hospital*+ao	Gen	NPAssn	160	70	40	511	3,000
Philipsburg, 3,600—Centre							
McGirk Sanatorium	Gen	Indiv	16	6	6	37	227
Philipsburg State Hosp.*+ao	Gen	State	120	103	12	382	3,226
Phoenixville, 12,029—Chester							
Phoenixville Hospital	Gen	NPAssn	67	31	12	185	1,193
Pittsburgh, 669,817—Allegheny							
Allegheny General Hospital*+ao	Gen	NPAssn	541	388	54	857	9,350
Belvedere General Hospital	Gen	NPAssn	40	17	10	112	685
Children's Hospital*+ao	Chil	NPAssn	170	129	..	..	3,386
Elizabeth Steel Magee Hospital*+ao	Gen	NPAssn	288	226	112	3,042	9,466
Eye and Ear Hospital*+ao	ENT	NPAssn	101	48	..	..	4,003
Haddon Maternity Hospital	Mat	Corp	20	10	15	217	441
Leech Farm Sanatorium	TB	City	300	234	..	..	217
Mercy Hospital*+ao	Gen	Church	670	515	48	851	12,599
Montefiore Hospital*+ao	Gen	NPAssn	243	209	32	729	7,118
Municipal Hospital for Contagious Diseases	Iso	City	150	62	..	..	600
Passavant Hospital*+ao	Gen	Church	116	73	24	242	2,414
Pittsburgh Hospital*+ao	Gen	NPAssn	184	147	24	679	4,321
Presbyterian Hospital*+ao	Gen	NPAssn	150	86	..	16	3,116
Rosella Foundling and Maternity Hospital	MatCh	NPAssn	154	123	16	301	786
St. Francis Hospital*+ao	Gen	Church	604	584	48	1,234	14,217
St. John's General Hospital*+ao	Gen	NPAssn	185	139	40	883	4,718
St. Joseph's Hospital and Dispensary*+ao	Gen	Church	128	79	12	280	2,339
St. Margaret Memorial Hospital*+ao	Gen	Church	129	73	21	321	2,606
Shadyside Hospital*+ao	Gen	NPAssn	240	167	40	852	5,891
South Side Hospital*+ao	Gen	NPAssn	207	133	18	474	4,924
Tuberculosis League Hosp.*+ao	TB	NPAssn	150	143	..	..	203
U. S. Marine Hospital	Gen	USPHS	73	68	..	..	1,282
Western Pennsylvania Hospital*+ao	Gen	NPAssn	600	343	61	1,113	9,591
Woman's Hospital	Gen	NPAssn	140	..	..	..	Estab. 1939
Pittston, 18,246—Luzerne							
Pittston Hospital*+ao	Gen	NPAssn	115	84	18	381	3,863
Pottstown, 19,430—Montgomery							
Homeopathic Hospital*+ao	Gen	NPAssn	50	19	10	166	1,075
Pottstown Hospital*+ao	Gen	NPAssn	62	48	12	232	1,673
Pottsville, 24,300—Schuylkill							
A. C. Milliken Hospital	Gen	NPAssn	50	45	15	318	1,962
Lemos B. Warne Hospital	Indiv	75	..	..	..	..	No data supplied
Pottsville Hospital*+ao	Gen	NPAssn	155	112	17	469	3,478
Punxsutawney, 9,266—Jefferson							
Adrian Hospital	Gen	NPAssn	76	63	10	344	2,336
Quakertown, 4,883—Bucks							
Quakertown Hospital	Gen	NPAssn	48	25	12	161	864
Ransom, 160—Lackawanna							
Ransom Home and Mental Hospital	Ment	County	382	370	..	..	51
Reading, 111,421—Berks							
Berks County Tuberculosis Sanatorium	TB	County	134	134	..	..	127
Homeopathic Hospital*+ao	Gen	NPAssn	100	66	19	406	2,900
Reading Hospital*+ao	Gen	NPAssn	252	203	37	829	5,561
St. Joseph Hospital*+ao	Gen	Church	205	67	25	626	4,569
Renovo, 3,947—Clinton							
Renovo Hospital	Gen	NPAssn	26	10	4	104	607
Retreat, 2,600—Luzerne							
Retreat Mental Hospital	Ment	County	1,175	1,094	..	..	218
Ridgway, 6,313—Elk							
Elk County General Hosp.	Gen	NPAssn	62	37	9	183	1,355
Ridley Park, 3,356—Delaware							
Taylor Hospital	Gen	NPAssn	70	59	18	273	1,823
Roaring Spring, 2,724—Blair							
Nason Hospital	Gen	NPAssn	52	32	12	152	1,081
Rochester, 7,726—Beaver							
Rochester General Hosp.*+ao	Gen	NPAssn	87	71	12	343	2,203
St. Marys, 7,423—Elk							
Andrew Kaul Memorial Hospital	Gen	Church	45	23	12	164	769
Sayre, 7,902—Bradford							
Robert Packer Hosp.*+ao	Gen	NPAssn	304	211	21	613	7,630
Schuylkill Haven, 6,514—Schuylkill							
Schuylkill County Hospital for Mental Diseases	Ment	County	521	574	..	..	135
Scranton, 143,433—Lackawanna							
Hahnemann Hospital*+ao	Gen	NPAssn	109	99	16	557	2,828
Lackawanna County Tuberculosis Hospital	TB	County	150	148	..	..	149
Mercy Hospital	Gen	Church	84	63	20	325	1,596
Moore Taylor Hospital*+ao	Gen	NPAssn	120	90	..	..	2,070
St. Joseph's Children's and Maternity Hospital	MatCh	Church	185	126	24	61	153
St. Mary's Mater Misericordiae Hospital	Gen	Church	73	52	12	242	1,524
Scranton Private Hospital	Gen	Corp	32	10	5	11	739

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Scranton State Hospital*+ao	Gen	State	287	122	20	420	3,006
West Side Hospital*+ao	Gen	NPAssn	63	69	10	359	2,253
Sellersville, 2,063—Bucks							
Grand View Hospital*+ao	Gen	NPAssn	73	45	25	312	1,177
Sewickley, 5,599—Allegheny							
Valley Hospital*+ao	Gen	NPAssn	113	90	27	565	3,262
Shamokin, 20,274—Northumberland							
Shamokin State Hospital	Gen	State	88	89	16	516	3,031
Sharon, 25,908—Mercer							
Christian H. Buhl Hosp.*+ao	Gen	NPAssn	133	92	25	606	3,333
Shenandoah, 21,782—Schuylkill							
Locust Mountain State Hospital	Gen	State	77	60	12	374	2,501
Somerset, 4,395—Somerset							
Somerset Community Hosp.	Gen	NPAssn	70	30	8	112	1,253
South Mountain, 200—Franklin							
Pennsylvania State Tuberculosis Sanatorium No. 1	TB	State	1,021	985	..	..	939
Spangler, 2,761—Cambria							
Miners' Hospital of Northern Cambria	Gen	NPAssn	76	57	10	258	1,824
State, —Cambria							
Pennsylvania State Tuberculosis Sanatorium No. 2	TB	State	840	806	..	..	767
Sunbury, 15,626—Northumberland							
Mary M. Packer Hospital	Gen	NPAssn	73	60	14	231	2,233
Susquehanna, 3,203—Susquehanna							
Simon H. Barnes Memorial Hospital	Gen	NPAssn	15	9	5	41	306
Tarantum, 9,551—Allegheny							
Allegheny Valley Hosp.*+ao	Gen	NPAssn	90	84	15	350	2,466
Taylor, 10,423—Lackawanna							
Taylor Hospital	Gen	NPAssn	44	39	12	217	1,542
Titusville, 8,055—Crawford							
Titusville Hospital	Gen	NPAssn	50	29	14	262	1,315
Torrance, 500—Westmoreland							
Torrance State Hospital	Ment	State	1,771 ¹	1,717	..	..	332
Uniontown, 19,544—Fayette							
Uniontown Hospital*+ao	Gen	NPAssn	210	185	25	477	5,161
Warren, 14,863—Warren							
Warren General Hospital*+ao	Gen	NPAssn	84	54	18	400	2,251
Warren State Hospital*+ao	Ment	State	2,400 ¹	2,362	..	..	626
Warrington, 150—Bucks							
Horace Berk Memorial Hospital	N&M	NPAssn	13	7	..	..	69
Washington, 24,545—Washington							
Hillsview Sanitarium	Gen	Corp	48	24	..	..	100
Washington Hospital*+ao	Gen	NPAssn	138	98	28	451	3,901
Waymart, 902—Wayne							
Farview State Hospital	Ment	State	1,000 ¹	879	..	..	103
Waynesboro, 10,167—Franklin							
Waynesboro Hospital	Gen	NPAssn	57	30	15	240	1,281
Waynesburg, 4,915—Greene							
Greene County Memorial Hospital	Gen	NPAssn	68	39	10	136	1,304
Wernersville, 1,096—Berks							
Wernersville State Hospital	Ment	State	1,700 ¹	1,467	..	..	306
West Chester, 12,325—Chester							
Chester County Hospital*+ao	Gen	NPAssn	159	84	22	468	2,882
Homeopathic Hospital of Chester County	Gen	NPAssn	62	47	15	235	1,787
Marshall Square Sanitarium	N&M	Part	60	35	..	..	77
White Haven, 1,537—Luzerne							
White Haven Sanatorium*+ao	TB	NPAssn	240	100	..	..	207
Wilkes-Barre, 86,626—Luzerne							
Mercy Hospital*+ao	Gen	Church	195	135	25	489	4,531
Wilkes-Barre Gen. Hosp.*+ao	Gen	NPAssn	362	251	41	897	6,413
Wyoming Valley Homeopathic Hospital	Gen	NPAssn	87	66	20	364	2,079
Wilkinsburg, 29,539—Allegheny							
Columbia Hospital*+ao	Gen	Church	186	109	31	621	3,519
Williamsport, 45,729—Lycoming							
Rothliss Clinic and Hosp.	Gen	Indiv	25	10	6	44	290
Williamsport Hospital*+ao	Gen	NPAssn	231	144	31	731	5,627
Windber, 9,205—Somerset							
Windber Hospital*+ao	Gen	NPAssn	107	83	10	279	3,144
Woodville, 4,000—Allegheny							
Allegheny County Home and Hospital for the Insane	Ment	County	3,735	3,341	..	..	1,374
York, 55,254—York							
West Side Sanitarium	Gen	Indiv	50	22	10	48	686
York Hospital*+ao	Gen	NPAssn	194	136	25	676	5,335
Related Institutions							
Bellefonte, 4,804—Centre							
Western State Penitentiary Hospital	Inst	State	22	10	..	..	518
B							
Home and Hospital	Mat	Church	10	5	10	61	118
Broomall, 1,200—Delaware							
Convalescent Hospital	Conv	Frat	31	21	..	..	347
Bryn Mawr, 10,206—Montgomery							
Bryn Mawr College Infirmary	Inst	NPAssn	19	5	..	..	398
Cambridge Springs, 1,665—Crawford							
San Rosario Sanitarium	Conv	Church	34	13	..	..	355
Chambersburg, 13,788—Franklin							
Chambersburg Maternity Home	Mat	Part	8	4	8	172	174

Key to symbols and abbreviations is on page 1195

PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Chester, 59,164—Delaware Mercy Hospital	Gen	Indiv	35	11	8	81	627
Darby, 9,899—Delaware St. Francis' Country House for Convalescents and Incurables	Conv	Church	54	50	..	..	350
Ebensburg, 3,063—Cambria Cambria County Hospital..	Inst	County	100	88	..	..	94
Elwyn, 200—Delaware Elwyn Training School.....	MeDe	NPAssn	1,090	1,012	..	..	50
Embserville, 500—Chester Chester County Institution District	Ment	County	340	340	..	..	75
Erie, 115,967—Erie Lakeview Hospital	Iso	City	84	..	..	..	No data supplied
Harmarville, 786—Allegheny Harmarville Convalescent Home	Conv	NPAssn	46	45	30	..	312
Huntingdon, 7,558—Huntingdon Pennsylvania Industrial School	Inst	State	36	11	..	..	1,081
Johnstown, 66,993—Cambria Municipal Hospital	Iso	City	60	3	..	..	103
Lancaster, 59,949—Lancaster Lancaster County Institution District	Ment	County	494	466	..	..	296
Langhorne, 1,147—Bucks Marydell School	MeDe	Part	50	..	..	..	7
Laurelton, 327—Union Laurelton State Village.....	MeDe	State	732 ¹	699	..	..	46
Mercer, 2,125—Mercer Mercer County Home and Hospital	Ment	County	375	330	..	..	111
Middletown, 6,085—Dauphin Odd Fellows' Home.....	Inst	Frat	45	35	..	..	38
Morgantown, 1,500—Washington Pennsylvania Training School	Inst	State	23	10	..	..	512
Muncy, 2,413—Lycoming Muncy Valley Hospital.....	Gen	NPAssn	20	7	6	46	231
New Wilmington, 907—Lawrence Overlook Sanitarium	Conv	Part	32	14	..	..	174
North East, 3,670—Erie St. Barnabas' House by the Lake	Incur	Church	32	..	..	..	No data supplied
Onkbourne (West Chester P.O.), 100—Chester James C. Smith Memorial Home	Conv	Church	23	14	..	..	266
Pennsylvania Epileptic Hospital and Colony Farm.....	Epil	NPAssn	140	130	..	..	40
Olyphant, 10,743—Lackawanna Blakely Home	Ment	County	156	151	..	..	25
Pennhurst (Spring City P.O.), 100—Chester Pennhurst State School.....	MeDe	State	1,893 ¹	1,867	..	..	181
Philadelphia, 1,850,961—Philadelphia Babies' Hospital	Chil	NPAssn	14	9	..	..	316
Belmont Hospital, Salvation Army Home and Hospital	Mat	Church	10	5	10	143	171
Eastern State Penitentiary Hospital	Inst	State	80	49	..	..	1,425
Florence Crittenton Home.....	Mat	NPAssn	28	12	1	35	51
Home of the Merciful Saviour for Crippled Children.....	Orth	NPAssn	62	62	..	..	5
Homewood School	InstMat	NPAssn	115	115	12	14	53
Kenwood Sanitarium	Conv	Corp	32	28	..	..	88
Philadelphia County Prison Hospital (Holmesburg)	Inst	CyCo	75	35	..	..	700
Philadelphia County Prison Hospital (Reed St.)	Inst	County	40	12	..	..	482
Philadelphia Home for Incurables	Incur	NPAssn	235	225	..	..	49
Pine Hall Convalescent Home	Conv	Indiv	19	17	..	..	46
Sharon Hall	Conv	Corp	70	55	..	..	50
Widener Memorial Industrial Training School for Crippled Children	Orth	NPAssn	100	75	..	..	6
Pittsburgh, 29,817—Allegheny Fairview Sanitarium	Ment	Corp	12	7	..	..	17
Industrial Home for Crippled Children	Orth	NPAssn	80	75	..	..	125
Jewish Home for the Aged..	NPAssn	State	55	54	..	..	47
Western Penitentiary Hosp..	Inst	State	39	17	..	..	568
Polk, 3,337—Venango Polk State School.....	MeDe	State	3,000 ¹	2,865	..	..	135
Pottstown, 19,430—Montgomery Hill School Infirmary.....	Inst	NPAssn	40	9	..	..	420
Retreat, 2,000—Luzerne Luzerne County Home and Infirmary	Inst	County	500	294	..	..	97
Rochester, 7,724—Beaver Passavant Memorial Homes for the Care of Epileptics..	Epil	Church	175	124	..	..	27
Seranton, 143,433—Lackawanna Municipal Hospital for Contagious Diseases	Iso	City	45	8	..	..	50
Sellingsgrove, 2,797—Snyder Sellingsgrove State Colony for Epileptics	Epil	State	464 ¹	441	..	..	44

PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Somerset, 4,395—Somerset Somerset County Home and Hospital	Ment	County	534	503	..	..	12
State College, 4,450—Centre Pennsylvania State College Health Service Hospital...	Inst	State	30	3	..	..	3
Towanda, 4,104—Bradford Mills Hospital	Gen	Indiv	31	8	9	107	12
Troy, 1,190—Bradford Martha Lloyd School.....	MeDe	NPAssn	125	125	..	..	3
Wawa, 300—Delaware Sanatorium School	Orth	Indiv	30	15	..	..	..
Wellsboro, 3,643—Tioga Wellsboro Hospital	Gen	NPAssn	9	3	2	6	6
Wilkes-Barre, 86,626—Luzerne Contagious Disease Hosp....	Iso	City	12	2	..	..	..
Williamstown, 2,958—Dauphin Williams Valley Hospital...	Gen	NPAssn	24	1	2	..	2
Willow Grove, 3,000—Montgomery Willow Crest for Convalescents	Conv	NPAssn	82	65	..	..	11

RHODE ISLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Central Falls, 25,898—Providence							
Notre Dame Hospital.....	Gen	NPAasn	50	38	12	26	124
East Greenwich, 3,666—Kent							
Crawford Allen Memorial							
Hospital.....	Unit of Rhode Island Hospital, Providence						
East Providence, 29,995—Providence							
Emma Pendleton Bradley							
Home	NervChil	NPAasn	50	47	..	..	6
Hillsgrove, 1,000—Kent							
St. Joseph's Sanatorium....	TB	Church	75	35	..	..	11
Howard, 5,000—Providence							
State Hospital for Mental							
Diseases+◊	Ment	State	3,000 ¹	2,782	..	..	60
State Infirmary▲	Gen	State	1,133	816	21	40	50
Newport, 27,612—Newport							
Newport Hospital▲	Gen	NPAasn	150	99	25	50	322
Station Hospital	Gen	Army	32	21	..	..	8
U. S. Naval Hospital▲	Gen	Navy	182	127	..	..	10
Pawtucket, 77,149—Providence							
Memorial Hospital▲◊	Gen	NPAasn	166	131	33	745	346
Providence, 252,981—Providence							
Butler Hospital+◊	N&M	NPAasn	174	146	..	..	14
Charles V. Chapin Hosp.+▲◊, Tblso	City		265	185	..	..	172
Homeopathic Hospital▲+▲◊, Gen	NPAasn		166	125	34	812	460
Jane Brown Memorial Hosp., Unit of Rhode Island Hospital							
Miriam Hospital▲	Gen	NPAasn	63	47	14	372	154
Providence Lying-in Hosp.◊ Mat	NPAasn		155	104	155	3,151	345
Rhode Island Hospital▲+▲◊, Gen	NPAasn		623	337	..	..	760
St. Joseph's Hospital▲+▲◊, Gen	Church		307	189	43	859	573
Wakefield, 4,000—Washington							
South County Hospital.....	Gen	NPAasn	47	19	14	150	90
Wallum Lake, 100—Providence							
State Sanatorium†	TB	State	580	521	..	..	28
Westerly, 10,997—Washington							
Westerly Hospital▲	Gen	NPAasn	61	27	12	226	90
Woonsocket, 49,370—Providence							
Woonsocket Hospital▲	Gen	NPAasn	145	75	29	349	374

SOUTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Abbeville, 4,414—Abbeville Abbeville County Memorial Hospital	Gen	NPAssn	22	11	2	21	20
Aiken, 6,032—Aiken Aiken County Hospital.....	Gen	County	60	65	12	126	120
Anderson, 14,323—Anderson Anderson County Hosp.+	Gen	NPAssn	111	70	14	267	240
Bennettsville, 3,667—Marlboro Marlboro County General Hospital+	Gen	NPAssn	22	22	8	81	142
Camden, 5,182—Kershaw Camden Hospital+	Gen	NPAssn	50	39	19	145	140

REGISTERED HOSPITALS

SOUTH DAKOTA

SOUTH CAROLINA—Continued

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Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Charleston, 62,265—Charleston	Gen	NPAasn	50	26	10	196	1,303
Baker Memorial Sanat.†	Gen	NPAasn	270	268	30	761	8,261
Roper Hospital†	Gen	Church	50	32	13	181	1,005
St. Francis Xavier Infirmary	Gen	Navy	57	23	2	21	415
U. S. Naval Hospital	Gen	NPAasn	58	17	6	84	1,006
Ohester, 5,528—Chester	Gen	NPAasn	18	6	4	24	302
Pryor Hospital	Gen	NPAasn	275	237	30	640	8,048
Clinton, 5,643—Laurens	Gen	County	70	...	6	Estab. 1939	1,852
Columbia, 51,581—Richland	Gen	NPAasn	96	52	14	196	1,852
Columbia Hospital†	Gen	Church	70	32	...	...	42
Good Samaritan-Waverly	Gen	NPAasn	90	62	6	108	2,291
Hospital	Gen	Church	90	62	6	108	2,291
Providence Hospital	Gen	Church	90	62	6	108	2,291
Ridgewood Tuberculosis	TB	NPAasn	90	62	6	108	2,291
Camp	Gen	Church	90	62	6	108	2,291
South Carolina Baptist Hos-	Gen	Church	90	62	6	108	2,291
pital	Gen	Church	90	62	6	108	2,291
South Carolina State Hos-	Gen	State	4,472	4,415	...	...	1,603
pital	Gen	Vet	618	515	...	...	4,493
Veterans Admin. Facility	Gen	Corp	35	20	...	...	260
Waverley Sanitarium	N&M	NPAasn	66	30	10	276	2,294
Conway, 3,011—Horry	Gen	NPAasn	66	30	10	276	2,294
Conway Hospital	Gen	NPAasn	66	30	10	276	2,294
Florence, 14,774—Florence	Gen	County	88	77	...	...	132
Florence-Darlington Tub-	TB	County	191	143	16	217	4,937
erculosis Sanatorium	TB	NPAasn	85	54	4	83	1,987
McLeod Infirmary	Gen	NPAasn	85	54	4	83	1,987
Saunders Memorial Hosp.	Gen	County	48	35	4	60	1,120
Gaffney, 6,827—Cherokee	Gen	County	48	35	4	60	1,120
Cherokee County Hospital	Gen	County	48	35	4	60	1,120
Greenville, 29,154—Greenville	Gen	County	81	78	...	...	110
Greenville County Tuberculo-	TB	County	244	182	23	626	6,189
sis Sanatorium	TB	City	15	3	...	...	300
Greenville General Hosp.	Gen	Indiv	94	61	20	358	2,998
Dr. Jervy's Private Hosp.	ENT	Church	65	60	...	...	318
St. Francis Hospital	Gen	Frnt	22	11	2	22	215
Shriners Hospital for Crip-	Orth	Frnt	22	11	2	22	215
pled Children	Orth	Frnt	22	11	2	22	215
Working Benevolent Hosp.	Gen	NPAasn	36	16	6	26	527
Greenwood, 11,020—Greenwood	Gen	NPAasn	75	40	8	208	2,025
Brewer Hospital	Gen	NPAasn	36	25	4	211	1,580
Greenwood Hospital	Gen	NPAasn	36	25	4	211	1,580
Hartsville, 5,067—Darlington	Gen	NPAasn	20	9	4	58	394
Byerly Hospital	Gen	Indiv	35	14	5	63	605
Powe Hospital	Gen	County	35	14	5	63	605
Laurens, 5,443—Laurens	Gen	County	52	33	6	60	687
Laurens County Hospital	Gen	County	52	33	6	60	687
Moncks Corner, 623—Berkeley	Gen	NPAasn	92	54	4	31	1,095
Berkeley County Hospital	Gen	NPAasn	92	54	4	31	1,095
Moultrieville, 515—Charleston	Gen	Army	60	31	10	122	1,561
Station Hospital	Gen	Army	60	31	10	122	1,561
Mullins, 3,158—Marion	Gen	NPAasn	60	62	...	...	111
Mullins Hospital	Gen	NPAasn	60	62	...	...	111
Navy Yard, 1,025—Charleston	TB	County	60	62	...	...	111
Pinehaven Sanatorium	TB	County	60	62	...	...	111
Newberry, 7,298—Newberry	Gen	NPAasn	23	13	5	98	805
Newberry County Hospital	Gen	NPAasn	23	13	5	98	805
Orangeburg, 8,776—Orangeburg	Gen	NPAasn	116	79	12	165	3,712
Tri-County Hospital	Gen	NPAasn	116	79	12	165	3,712
Parris Island, 230—Beaufort	Gen	Navy	137	35	4	20	633
U. S. Naval Hospital	Gen	Navy	137	35	4	20	633
Rock Hill, 11,322—York	Gen	Church	75	61	6	169	2,264
St. Philip's Mercy Hospital	Gen	Church	75	61	6	169	2,264
Seneca, 1,820—Oconee	Gen	NPAasn	45	...	4	Estab. 1939	...
Oconee County Hospital	Gen	NPAasn	45	...	4	Estab. 1939	...
Six Mile, 150—Pickens	Gen	Indiv	29	12	1	21	453
Dr. Peck's Hospital	Gen	Indiv	29	12	1	21	453
Spartanburg, 28,723—Spartanburg	Gen	NPAasn	42	31	4	63	1,825
Mary Black Memorial Hos-	Gen	NPAasn	42	31	4	63	1,825
pital	Gen	NPAasn	42	31	4	63	1,825
Spartanburg General Hos-	Gen	County	230	174	16	545	5,654
pital	Gen	County	230	174	16	545	5,654
State Park, ...—Richland	Unit of	South Carolina	440	426	...	...	551
Palmetto Sanatorium	Unit of	South Carolina	440	426	...	...	551
South Carolina Sanatorium	TB	State	440	426	...	...	551
Summerville, 2,570—Dorchester	Gen	County	41	18	11	48	443
Dorchester County Hospital	Gen	County	41	18	11	48	443
Sumter, 11,750—Sumter	Gen	NPAasn	95	70	10	247	2,044
Thomey Hospital	Gen	NPAasn	95	70	10	247	2,044
Walterboro, 2,592—Colleton	Gen	Indiv	37	20	5	86	1,387
Charles E. Dorn Hospital	Gen	Indiv	37	20	5	86	1,387
Related Institutions							
Charleston, 62,265—Charleston	Inst	City	24	2	...	...	175
Charleston Orphan House	Inst	City	24	2	...	...	175
Clinton, 5,643—Laurens	Inst	Church	56	5	...	...	459
Lesh Infirmary of Thornwell	Inst	Church	733	724	1	2	58
Orphanage	Inst	McDe	733	724	1	2	58
State Training School	Inst	McDe	44	3	...	...	168
Greenville, 29,154—Greenville	Inst	NPAasn	17	12	6	38	535
Webb Memorial Infirmary	Inst	NPAasn	17	12	6	38	535
Ridgeland, 715—Jasper	Inst	Indiv	20	...	...	...	No data supplied
Evelyn Ritter Hospital	Inst	Indiv	20	...	...	...	No data supplied
Spartanburg, 28,723—Spartanburg	Inst	Indiv	20	...	...	...	No data supplied
Broadview Sanitarium	Inst	Conv	26	19	...	...	42
Sumter, 11,750—Sumter	Inst	CyCo	26	19	...	...	42
Camp Alice, Sumter County	Inst	CyCo	26	19	...	...	42
Tuberculosis Sanitarium	Inst	CyCo	26	19	...	...	42
Union, 7,419—Union	Inst	County	25	14	3	74	752
Wallace Thomson Hospital	Inst	County	25	14	3	74	752

Key to symbols and abbreviations is on page 1195

SOUTH DAKOTA—Continued

REGISTERED HOSPITALS

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Related Institutions	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Hot Springs, 2,008—Fall River State Soldiers' Home Hosp.. Inst	State	IA	40	20	..	..	234
Pierre, 3,639—Hughes Pierre Indian School Hosp.. Gen	IA	Indiv	18	9	..	..	..
Platte, 1,207—Charles Mix Platte Hospital	Gen	Indiv	8	4	6	14	133
Redfield, 2,664—Spink State School and Home for Feeble-minded	MeDe	State	750	631	..	..	48
Sisseton, 1,569—Roberts Sisseton Indian Hospital.... Gen	IA	Indiv	30	17	8	54	573
Wagner, 1,420—Charles Mix Duggan Hospital	Gen	IA	14	9	3	38	334
Yankton Indian Hospital... Gen	IA	..	26	16	6	41	671

TENNESSEE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Athens, 5,385—McMinn Epperson Clinic-Hospital.... Gen	Indiv	Part	23	6	2	57	422
Force Hospital	Gen	..	20	10	6	48	502
Brownsville, 3,204—Haywood Haywood County Memorial Hospital	Gen	NPAssn	34	20	4	50	650
Chattanooga, 110,798—Hamilton Barones Erlanger Hosp.*** Gen	CyCo	..	440	231	69	1,376	9,512
Nevel and Nevel Sanit.*** Gen	Part	..	65	32	3	29	1,380
Pine Breze Sanatorium*** TB	NPAssn	..	270	249	..	..	461
T. C. Thompson Children's Hospital***	MatCh	CyCo	73	44	11	170	1,302
Clarksville, 9,242—Montgomery Clarksville Home Infirmary. Gen	Indiv	..	25	6	..	8	380
Clarksville Hospital	NPAssn	..	40	20	6	82	1,763
Columbia, 7,882—Maury Kings Daughters Hospital. Gen	NPAssn	..	50	16	8	30	219
Dayton, 2,006—Rhea Broyles Private Hospital... Gen	Indiv	..	12	7	4	35	630
Dyersburg, 8,733—Dyer Bald-Brewer Gen. Hosp.*** Gen	Corp	..	50	12	8	110	561
Elizabethton, 8,093—Carter St. Elizabeth General Hosp.. Gen	Corp	..	20	8	5	30	203
Erwin, 3,623—Unicoi Erwin Community Hospital Gen	Corp	..	14	2	4	57	487
Franklin, 3,377—Williamson German-Rice Hospital	Part	..	18	12	4	28	712
Greeneville, 5,214—Greene Greeneville Sanatorium and Hospital***	Corp	..	60	16	3	83	1,396
Takoma Hospital and Sanit.***	Gen	NPAssn	52	37	6	37	350
Humboldt, 4,613—Gibson Oursler Clinic	Gen	Indiv	10	5	3	72	613
Jackson, 22,172—Madison Fitts-White Clinic	Gen	Part	34	15	6	96	811
Memorial Hospital	Gen	NPAssn	24	15	6	45	505
Webb-Williamson Hospital-Clinic	Gen	Corp	20	10	3	270	1,507
Jefferson City, 1,895—Jefferson Jefferson Hospital	Gen	Indiv	17	4	..	..	1,038
Johnson City, 25,080—Washington Appalachian Hospital*** Gen	NPAssn	..	20	8	2	5	233
Campbell's Eye, Ear, Nose and Throat Hospital.... ENT	Indiv	..	53	48	9	586	2,358
Jones Eye, Ear, Nose and Throat Hospital	Part	..	160	122	..	..	101
Parker-Budd Clinic and Hospital***	Gen	Part	1,572	1,522	..	..	455
Kingsport, 11,914—Sullivan Holston Valley Community Hospital***	Gen	NPAssn	150	124	30	606	4,234
Knoxville, 105,802—Knox Beverly Hills Sanatorium... TB	CyCo	State	279	178	33	703	5,165
Eastern State Hospital.... Ment	State	..	67	59	12	241	1,555
Fort Sanders Hospital*** Gen	NPAssn	..	..	8	2	61	454
Knoxville General Hosp.*** Gen	Church	..	27	6	2	22	457
St. Mary's Memorial Hosp.*** Gen	Indiv	..	12	15	3	101	1,014
Lebanon, 4,655—Wilson Martha Gaston Hospital.... Gen	Indiv	..	10	4	2	15	190
McFarland Hospital	Gen	..	20	..	6	Estab. 1923	..
Livinston, 1,538—Overton Lady Ann Hospital	Gen	..	..	..	..	..	..
Loudon, 2,578—Loudon Loudon County Hospital... Gen	County	..	..	..	..	..	..
Madison College, —Davidson Madison Rural Sanitarium and Hospital***	Gen	NPAssn	100	75	6	94	1,503
Maryville, 4,955—Blount Fort Craig Hospital.... Gen	Indiv	..	40	12	2	45	529
Memphis, 23,143—Shelby Baptist Memorial Hosp.*** Gen	Church	..	50	17	10	12	476
Collins Chapel Connectional Hospital	Church	..	..	..	..	..	..

Key to symbols and abbreviations is on page 1195

TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basinets	Number of Births	Admissions
Crippled Children's Hospital School	Orth	NPAssn	40	20	..	..	..
Gartley-Ramsay Hospital*** Gen	Corp	..	42	20	..	..	..
Hospital for Crippled Adults	Gen	..	66	50	61	1,453	15,712
John Gaston Hospital*** Gen	NPAssn	..	530	484	61	1,453	15,712
Lynchburg Sanitarium	Gen	..	20	12	..	..	..
McLemore Clinic	N&M	Indiv	43	20	12	12	1,187
Memphis Eye, Ear, Nose and Throat Hospital*** ENT	NPAssn	..	65	20	..	..	..
Methodist Hospital*** Gen	Church	..	155	148	80	83	6,712
St. Joseph's Hospital*** Gen	Church	..	200	143	40	63	6,231
Turner-Gotten Sanitarium... N&M	Part	..	20	12	..	..	..
U. S. Marine Hospital... Gen	USPHS	..	130	111	..	..	..
Veterans Admin. Facility... Vet	Indiv	..	450	415	..	..	..
Wallace Sanitarium	N&M	Indiv	75	16	..	..	..
Willis C. Campbell Clinic*** Orth	Part	..	60	45	..	..	..
Morristown, 7,305—Hamblen Morristown General Hosp... Gen	Corp	..	25	7	6	42	34
Mountain Home, —Washington Veterans Admin. Facility... Gen	Vet	..	563	493	..	..	..
Murfreesboro, 7,993—Rutherford Rutherford Hospital	Gen	NPAssn	42	16	8	151	2,112
Nashville, 153,866—Davidson Central State Hospital.... Ment	State	..	1,870	1,622	..	..	46
City View Sanitarium... N&M	Indiv	..	65	27	..	..	..
Davidson County Tuberculosis Hospital*** TB	County	..	355	238	..	..	..
Geo. W. Hubbard Hospital of Meharry Medical College*** Gen	NPAssn	..	163	108	21	237	2,571
Hospital for the Criminal Insane	Unit of Central State Hospital	..	260	195	36	1,040	7,112
Nashville General Hosp.*** Gen	City	..	104	75	18	465	2,831
Protestant Hospital*** Gen	NPAssn	..	225	161	25	758	6,316
St. Thomas Hospital*** Gen	Church	..	333	255	58	591	7,221
Vanderbilt University Hospital*** Gen	NPAssn	..	12	..	2	Reopened	..
Newport, 2,989—Cooke Surgical Clinic and Infirmary	Gen	Indiv	340	235	..	..	600
Oakville, 163—Shelby Oakville Memorial Sanat. TB	CyCo	..	24	8	4	29	4
Paris, 8,164—Henry McSwain Clinic	Indiv	..	25	7	3	25	4
Nobles Memorial Hospital... Gen	Part	..	..	..	..	..	..
Pleasant Hill, 165—Cumberland "Uplands" Cumberland Mountain Sanitarium	GenTb	NPAssn	43	16	6	10	17
Pressmen's Home, 160—Hawkins International Printing Pressmen and Assistants' Union Sanitarium	TB	NPAssn	40	25	..	..	13
Pulaski, 3,367—Giles Pulaski Hospital	Gen	Indiv	23	8	2	31	54
Raleigh, 287—Shelby Cheerfield Farm Preventorium	Unit of Oakville Memorial Sanatorium, Oakville	..	..	..	..	..	..
Ridgetop, 196—Robertson Watauga Sanitarium	TB	Corp	40	14	..	..	..
Rockwood, 3,898—Roane Chamberlain Memorial Hosp. Gen	NPAssn	..	60	20	10	56	87
Rogersville, 1,590—Hawkins Lyons Hospital	Gen	Indiv	14	6	4	15	213
Sewanee, 530—Franklin Emerald-Hodgson Memorial Hospital	Gen	Church	25	11	10	66	22
Springfield, 5,577—Robertson Robertson County Hospital. Gen	County	..	45	12	8	25	30
Sweetwater, 2,271—Monroe Sweetwater Hospital	Gen	NPAssn	28	12	4	27	45
Western State Hospital, —Hardeman Western State Hospital... Ment	State	..	1,900	2,050	..	..	67
Woodbury, 502—Cannon Good Samaritan Hospital... Gen	Indiv	..	26	16	6	40	57

Related Institutions

Bristol, 12,005—Sullivan Hooks-Engle Infirmary.... ENT	Part	..	9	3	..	..	..
Chattanooga, 110,798—Hamilton William L. Bork Memorial Hospital	Ment	County	220	223	..	..	17
Copperhill, 1,030—Polk Tennessee Copper Company's Hospital	Gen	NPAssn	10	1	..	16	4
Donelson, 110—Davidson Tennessee Home and Training School for Feeble-minded Persons	MeDe	State	515	625	..	..	..
Etowah, 4,200—McMinn Etowah Hospital	Gen	Indiv	10	3	3	24	27
Fayetteville, 3,822—Lincoln Lincoln County Hospital... Gen	County	..	20	20	2	26	76
Knoxville, 105,802—Knox Knox County Crippled Children's Hospital	Orth	NPAssn	20	17	..	..	121
Tennessee School for Deaf... Inst	State	..	20	2	..	..	45
University of Tennessee Hospital	Inst	State	13	5	..	..	..

TENNESSEE—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Memphis, 253,143—Shelby							
Henry G. Hill Clinic.....	Orth	Indiv	12	6	..	..	312
Shelby County Hospital.....	Inst	County	805	580	..	..	440
Shelby County Hospital.....	Ment	County	757	720	4	8	378
Crippled Children	Orth	NPAasn	36	26	..	..	92
Tennessee State Penitentiary							
Hospital	Inst	State	72	57	..	..	479
Shelbyville, 5,010—Bedford							
Bedford County Hospital..	Gen	NPAasn	42	21	2	120	783

TEXAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Abilene, 23,175—Taylor							
Abilene State Hospital.....	Epil	State	1,350 ¹	1,334	..	..	304
Hendrick Memorial Hosp.▲	Gen	Church	87	60	12	420	3,687
Alice, 4,239—Jim Wells							
Alice Hospital	Gen	Corp	23	10	5	75	604
Alpine, 3,495—Brewster							
Alpine Hospital	Gen	Indiv	10	3	2	15	..
Amarillo, 43,132—Potter							
Northwest Texas Hospital▲	Gen	County	150	57	20	272	2,191
St. Anthony's Hospital▲	Gen	Church	85	69	14	416	3,259
Atlanta, 1,685—Cass							
Ellington Memorial Hosp...	Gen	Part	11	5	4	81	412
Austin, 53,120—Travis							
Austin State Hospital.....	Ment	State	2,761 ¹	2,401	..	..	470
Austin-Travis County Sanatorium	TB	CyCo	48	..	..	Estab. 1940	..
Brackenridge Hospital▲	Gen	City	129	96	20	879	4,929
St. David's Hospital▲	Gen	Church	44	25	8	149	1,836
Sefon Infirmary▲	Gen	Church	116	68	16	324	3,599
Bastrop, 1,895—Bastrop							
F. A. Orgain Memorial Hosp. Gen		NPAasn	12	3	3	30	200
Baytown, 5,194—Harris							
Baytown Hospital	Gen	NPAasn	25	15	3	53	693
Beaumont, 57,732—Jefferson							
Hotel Dieu Hospital▲	Gen	Church	160	90	15	475	3,098
Jefferson County Tuberculosis Hospital	TB	County	89	89	..	..	80
Jefferson County Tuberculosis Hospital No. 2.....	TB	County	26	25	..	..	35
St. Therese Hospital.....	Gen	Church	75	40	10	366	1,863
Beeville, 4,806—Bee							
Beeville Hospital	Gen	Indiv	26	15	4	16	396
Thomas Memorial Hospital Gen		Part	36	18	4	94	506
Big Spring, 13,735—Howard							
Big Spring Hospital.....	Gen	Corp	35	15	6	141	995
Big Spring State Hospital..	Ment	State	400 ¹	226	..	..	420
Malone and Hogan Clinic-Hospital	Gen	Part	12	4	6	71	328
Bonham, 5,635—Pannin							
S. B. Allen Memorial Hosp.▲	Gen	NPAasn	22	15	4	64	420
Borger, 6,532—Hutchinson							
North Plains Hospital.....	Gen	County	20	..	No data supplied	..	..
Bowie, 3,131—Montague							
Bowie Clinic Hospital.....	Gen	Corp	15	6	3	28	334
Brackettville, 1,822—Kinney							
Station Hospital	Gen	Army	49	22	2	22	636
Brady, 3,983—McCulloch							
Brady Hospital▲	Gen	Part	45	23	5	143	1,156
Brenham, 5,974—Washington							
St. Francis Hospital.....	Gen	Church	30	9	5	49	419
Sarah B. Milroy Memorial Hospital	Gen	Corp	21	5	2	31	379
Brownfield, 1,907—Terry							
Treadaway-Daniell Hospital. Gen		Part	20	9	6	61	445
Brownsville, 22,621—Cameron							
Mercy Hospital▲	Gen	Church	50	15	8	122	829
Station Hospital	Gen	Army	51	14	2	16	425
Brownwood, 12,789—Brown							
Brownwood Memorial Hosp. Gen		Corp	15	..	3	Estab. 1939	..
Medical Arts Hospital▲	Gen	Corp	27	12	4	37	748
Bryan, 7,814—Brazos							
Bryan College Medical Center Hospital	Gen	Indiv	23	9	2	145	719
St. Joseph Hospital.....	Gen	Church	25	9	6	90	713
Burnet, 1,655—Burnet							
Sheppard-Allen Hospital ...	Gen	Part	16	12	5	75	504
Cameron, 4,563—Milam							
Cameron Hospital▲	Gen	Indiv	54	14	4	112	708
Canadian, 2,068—Hemphill							
Canadian Hospital	Gen	Indiv	10	3	3	75	229
Canyon, 2,821—Randall							
Nebitt Hospital	Gen	Indiv	10	5	3	49	474
Carthage, 1,651—Panola							
Carthage General Hospital..	Gen	Indiv	20	..	No data supplied	..	..
Center, 2,510—Shelby							
Center Sanitarium	Gen	Indiv	13	4	3	32	175
Warren Hospital	Gen	Part	12	4	1	9	134
Childress, 7,163—Childress							
Jeter-Townsend Hospital ...	Gen	Part	20	6	2	75	320

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Cisco, 6,027—Eastland							
Graham Sanitarium	Gen	Indiv	22	6	3	21	444
Clarksville, 2,952—Red River							
Red River County Hospital. Gen		County	36	7	3	22	252
Cleburne, 11,539—Johnson							
Cleburne Sanitarium	Gen	Indiv	20	6	6	66	340
Clifton, 1,367—Bosque							
Goodall and Witcher Clinic-Hospital	Gen	Part	10	..	4	Estab. 1939	..
Coleman, 6,078—Coleman							
Overall Memorial Hospital..	Gen	CyCo	50	8	4	74	650
Colorado, 4,671—Mitchell							
C. L. Root Hospital.....	Gen	Indiv	14	5	3	70	371
Commerce, 4,267—Hunt							
Allen Hospital	Gen	Indiv	10	4	4	43	187
Leberman Hospital	Gen	Indiv	11	3	4	55	202
Conroe, 2,457—Montgomery							
Mary Swain Sanitarium.....	Gen	Indiv	18	6	4	25	350
Montgomery County Hosp..	Gen	County	38	11	6	61	632
Corpus Christi, 27,741—Nueces							
Fred Roberts Memorial Hospital▲	Gen	NPAasn	65	47	10	165	2,098
Medical-Professional Hosp..	Gen	Corp	32	12	4	37	835
Spohn Hospital▲	Gen	Church	85	51	18	441	3,237
Corsicana, 15,262—Navarro							
Corsicana Hosp. and Clinic. Gen		NPAasn	20	5	2	24	201
Navarro Clinic Hospital.....	Gen	Part	24	10	4	75	639
Physicians and Surgeons Hospital	Gen	County	50	15	6	106	820
Crockett, 4,441—Houston							
Jim Smith Memorial Hosp. and Crockett Clinic.....	Gen	Part	16	6	2	55	423
Crystal City, 6,609—Zavala							
Crystal Hospital	Gen	Corp	10	3	2	22	204
Cuero, 4,672—De Witt							
Burns Hospital	Gen	Church	25	10	3	21	334
Lutheran Hospital	Gen	Church	20	5	1	23	336
Dallas, 260,475—Dallas							
Baylor University Hosp.▲▲	Gen	Church	408	302	59	1,231	15,343
Beverly Hills Sanitarium... N&M		Corp	30	19	..	..	188
Bradford Memorial Hospital for Babies▲	Chil	NPAasn	60	24	..	..	925
Carman Sanitarium	TB	Corp	20	16	..	..	75
Carrell-Girard Clinic	Orth	Part	25	12	..	..	246
Dallas Medical and Surgical Clinic Hospital▲	Gen	Part	27	17	..	..	1,210
Gaston Hospital	Gen	NPAasn	50	..	..	Estab. 1939	..
Medical Arts Hospital▲	Gen	Corp	86	64	..	..	4,370
osp. Unit of Baylor University Hospital	Gen	Church	114	71	26	676	4,141
CyCo	Gen	CyCo	400	264	36	1,316	10,771
Indiv	Gen	Indiv	17	6	2	10	252
Church	Gen	Church	270	229	30	1,297	10,587
Pinkston Clinic	Gen	Indiv	60	57	..	..	617
St. Paul's Hospital▲	Gen	Church	50	22	..	..	191
Texas Scottish Rite Hospital for Crippled Children▲	Orth	Frat	116	105	..	..	195
Timberlawn Sanitarium	Ment	Corp	50	22	..	..	191
Woodlawn Hospital	TB	CyCo	116	105	..	..	195
Decatur, 2,037—Wise							
Rogers Hospital	Gen	Indiv	18	12	5	140	800
Denison, 13,850—Grayson							
Denison City Hospital.....	Gen	NPAasn	35	17	4	105	515
Missouri, Kansas, Texas Railroad Employees Hospital. Indus		NPAasn	65	37	..	..	645
Denton, 9,587—Denton							
Denton Hospital and Clinic. Gen		Indiv	25	9	4	67	610
Medical and Surgical Clinic. Gen		Part	12	6	2	46	500
Dublin, 2,271—Erath							
Guy Hospital	Gen	Indiv	13	4	3	74	243
Edinburg, 4,821—Hidalgo							
City-County Hospital	Gen	CyCo	50	19	8	62	607
Electra, 6,712—Wichita							
Electra Hospital	Gen	Indiv	21	6	3	72	388
El Paso, 102,421—El Paso							
El Paso City-County Hospital▲	Gen	CyCo	232	114	20	476	4,330
El Paso Masonic Hospital▲	Gen	Frat	61	25	13	150	977
Hendricks-Laws Sanatorium TB		Part	70	..	..	..	35
Hotel Dieu, Sisters' Hosp.▲	Gen	Church	100	70	23	362	2,999
Long Sanatorium	TB	Indiv	50	18	..	..	48
Newark Conference Maternity Hospital	Mat	Church	29	7	15	303	514
Providence Hospital	Gen	Indiv	40	23	3	33	1,157
St. Joseph's Sanatorium.....	TB	Church	75	35	..	..	337
Southwestern General Hospital▲	Gen	Corp	125	59	20	194	2,060
William Beaumont General Hospital▲	Gen	Army	672	399	7	70	4,967
Floresville, 1,551—Wilson							
Oxford Hospital	Gen	Indiv	10	3	2	14	271
Floydada, 2,637—Floyd							
Floydada Hosp. and Clinic..	Gen	Part	16	4	3	41	255
Fort Worth, 163,447—Tarrant							
All Saints Episcopal Hosp.▲	Gen	Church	65	43	12	380	2,210
City and County Hospital▲	Gen	CyCo	176	115	18	973	4,226
W. I. Cook Memorial Hospital▲	Gen	NPAasn	53	31	8	115	1,367
Fort Worth Children's Hospital▲	Chil	NPAasn	35	29	..	..	352
Harris Memorial Methodist Hospital▲	Gen	Church	225	121	26	610	4,532

Key to symbols and abbreviations is on page 1195

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basins	Number of Births	Admissions
St. Joseph's Hospital* ⁴	Gen	Church	200	107	21	602	5,093
U. S. Public Health Service Hospital.....	Drug	Fed	336	214	..	...	550
Fredericksburg, 2,416—Gillespie							
Fredericksburg Hospital and Clinic.....	Gen	Corp	15	6	4	19	230
Keddel Memorial Hospital and Clinic.....	Gen	Indiv	13	5	2	25	207
Freeport, 3,162—Brazoria							
Freeport Hospital.....	Gen	NPassn	14	5	6	82	362
Gainesville, 8,915—Cooke							
Gainesville Sanitarium.....	Gen	NPassn	45	26	12	164	3,061
Galveston, 52,938—Galveston							
Galveston State Psychopathic Hospital*.....	Ment	State	100 ¹	95	..	...	439
Hospital for Crippled and Deformed Children.....	Unit of	John Sealy Hospital					
John Sealy Hospital* ⁴	Gen	City	454	360	20	610	6,644
Negro Hospital.....	Unit of	John Sealy Hospital					
St. Mary's Infirmary* ⁴	Gen	Church	200	120	20	491	3,481
Station Hospital.....	Gen	Army	21	14	..	...	411
U. S. Marine Hospital* ¹	Gen	USPHS	206	158	..	...	3,643
Georgetown, 3,583—Williamson							
Martin Hospital.....	Gen	Indiv	20	5	4	28	247
Gilmer, 1,963—Upshur							
Elmwood Sanitarium.....	Gen	Indiv	15	2	3	49	264
Oak Lawn Sanitarium.....	Gen	Part	12	4	3	58	341
Ragland Clinic-Hospital.....	Gen	Part	15	8	5	154	639
Gladewater, 6,000—Gregg							
Gladewater Hospital.....	Gen	Indiv	10	2	2	35	154
Leake Clinic Hospital.....	Gen	Indiv	20	8	3	60	540
Gonzales, 3,859—Gonzales							
Holmes Hospital.....	Gen	Corp	25	5	3	12	316
Goose Creek, 5,208—Harris							
Goose Creek Hospital.....	Gen	Corp	12	8	6	225	756
Lillie and Duke Hospital.....	Gen	Part	21	11	6	72	408
Gorman, 1,154—Eastland							
Blackwell Sanitarium.....	Gen	Part	30	18	3	307	...
Graham, 4,981—Young							
Graham Hospital.....	Gen	NPassn	18	9	4	162	809
Greenville, 12,407—Hunt							
Dr. E. P. Beeton's Hospital.....	Surg	Indiv	16	3	..	5	433
Goode and Phillips Hospital.....	Gen	Part	10	4	4	52	103
Dr. Joe Beeton's Hospital.....	Gen	Indiv	20	7	2	12	264
Groesbeck, 2,659—Limestone							
Dr. Cox's Hospital.....	Gen	Indiv	12	2	5	31	109
Hallettsville, 1,406—Lavaca							
Renger Hospital.....	Gen	Indiv	15	6	3	23	204
Harlingen, 12,124—Cameron							
Medical Arts Clinic.....	Gen	Indiv	8	4	4	80	240
Valley Baptist Hospital.....	Gen	Church	35	16	10	101	863
Henderson, 2,932—Rusk							
Henderson Hospital.....	Gen	Corp	39	15	9	103	961
Hereford, 2,458—Deaf Smith							
Deaf Smith County Hosp... Gen		County	22	5	8	119	304
Hillsboro, 7,823—Hill							
Boyd Sanitarium.....	Gen	Indiv	23	5	3	25	310
Houston, 22,352—Harris							
Autry Memorial Hospital-School.....	Unit of	Houston Tuberculosis Hospital					
Dr. Greenwood's Sanitarium N&M	Corp		36	30	..	...	164
Heights Clinic-Hospital.....	Gen	Corp	40	14	8	224	1,054
Hermann Hospital* ⁴	Gen	NPassn	140	133	16	440	4,568
Houston Eye, Ear, Nose and Throat Hospital.....	ENT	NPassn	24	8	..	...	1,108
Houston Negro Hospital.....	Gen	NPassn	50	15	4	70	559
Houston Tuberculosis Hosp. TB	CyCo		172	155	..	...	350
Jefferson Davis Hosp.* ⁴	Gen	CyCo	470	342	30	2,187	13,227
Memorial Hospital* ⁴	Gen	Church	195	146	20	1,084	10,488
Methodist Hospital* ⁴	Gen	Church	120	89	12	412	4,000
Park View Hospital.....	Gen	Corp	30	11	6	101	673
St. Joseph's Infirmary* ⁴	Gen	Church	275	203	80	2,064	10,040
Southern Pacific Hospital* ¹	Indus	NPassn	140	71	..	...	1,879
Turner Urological Institute.....	Urol	Part	16	9	..	...	1,369
Wright Clinic and Hosp... Gen		Indiv	14	10	5	54	753
Huntsville, 5,028—Walker							
Huntsville Memorial Hosp... Gen		NPassn	21	...	...	...	No data supplied
Jacksboro, 1,837—Jack							
Jacksboro Hospital.....	Gen	Part	12	6	4	58	263
Jacksonville, 6,748—Cherokee							
Nan Travis Memorial Hosp.* ⁴ Gen		NPassn	63	35	9	136	2,100
Jasper, 3,333—Jasper							
Hardy-Hancock Hospital.....	Gen	Part	24	12	4	45	439
Richardson Hospital.....	Gen	Indiv	15	8	3	36	447
Kelly Field, —Bexar							
Station Hospital.....	Gen	Army	20	18	..	...	1,083
Kenedy, 2,610—Karnes							
Kenedy Clinic and Hospital.....	Gen	Indiv	16	6	3	52	...
Kermitt, —Winkler							
Robinson-McClure Clinic Hospital.....	Gen	Part	14	6	4	101	412
Kerrville, 4,346—Kerr							
Kerrville General Hospital.....	Gen	NPassn	21	6	4	29	277
Kerrville State Sanatorium.....	TB	State	172	170	..	...	316
Sunnyvale Sanatorium.....	TB	Indiv	29	17	..	...	54
Kilgore, 573—Gregg							
Kilgore Memorial Hospital.....	Gen	Part	21	10	4	124	682
Kingsville, 6,515—Klberg							
Klberg County Hospital.....	Gen	County	25	20	7	72	507

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census	Basins	Number of Births	Admissions
Knox City, 906—Knox							
Knox County Hospital.....	Gen	County	29	9	4	121	54
La Grange, 2,354—Fayette							
La Grange Hospital.....	Gen	Corp	50	...	...	...	No data supplied
Lamesa, 3,528—Dawson							
Loveless and Bennett Hosp. Gen		Part	23	9	6	132	47
Price Hospital.....	Gen	Indiv	12	6	5	63	107
Lampasas, 2,709—Lampasas							
Rollins-Brook Hospital.....	Gen	Part	20	13	3	106	68
Laredo, 32,618—Webb							
Mercy Hospital.....	Gen	Church	50	30	6	117	117
Station Hospital.....	Gen	Army	41	11	1	6	50
Legion, 100—Kerr							
Veterans Admin. Facility* ¹	GenTb	Vet	420	440	..	...	213
Levelland, 1,661—Hockley							
Phillips-Dupre Hospital.....	Gen	Part	10	6	5	63	42
Liberty, 2,187—Liberty							
Mercy Hospital.....	Gen	Church	22	14	6	85	70
Littlefield, 3,218—Lamb							
Littlefield Hosp. and Clinic.. Gen		Part	20	12	5	130	90
Payne-Shotwell Hospital and Clinic.....	Gen	Part	22	10	8	90	75
Livingston, 1,165—Polk							
Livingston Hospital.....	Gen	Indiv	16	6	3	106	58
Lockhart, 4,367—Caldwell							
Lockhart Sanitarium.....	Gen	NPassn	16	4	2	27	25
Longview, 5,036—Gregg							
Hurst Eye, Ear, Nose and Throat Hospital.....	ENT	NPassn	12	2	..	...	...
Markham-McRee Memorial Hospital.....	Gen	NPassn	35	9	8	125	51
Lubbock, 20,520—Lubbock							
Lubbock Sanitarium* ⁴	Corp	85	60	15	134	3,539	
Plains Hospital and Clinic.. Gen		Church	18	14	5	167	1,111
West Texas Hospital* ⁴	Gen	Corp	50	22	10	175	1,500
Lufkin, 7,311—Angellina							
Angellina County Hospital.. Gen		County	40	22	5	170	1,150
Madisonville, 1,294—Madison							
Heath Hospital and Clinic.. Gen		Indiv	18	5	2	43	50
Maria, 3,909—Presidio							
Station Hospital.....	Gen	Army	50	13	2	14	63
Marlin, 5,338—Falls							
Buie-Allen Hospital.....	Gen	Indiv	23	18	2	20	70
Torbett Clinic and Hosp.* ⁴ Gen		Corp	54	18	4	49	1,071
Marshall, 16,203—Harrison							
Kahn Memorial Hospital.....	Gen	NPassn	30	14	5	122	65
Texas and Pacific Railway Employees Hospital.....	Indus	NPassn	105	55	..	...	2,121
McAllen, 9,074—Hidalgo							
McAllen Municipal Hosp.* ⁴ Gen		City	65	...	...	...	No data supplied
McKinney, 7,307—Collin							
McKinney City Hospital* ⁴	Gen	City	46	25	4	103	1,000
Memphis, 4,257—Hall							
Memphis Hospital.....	Gen	Indiv	15	3	2	15	212
Mercedes, 6,608—Hidalgo							
Mercedes General Hospital.. Gen		NPassn	22	5	5	64	52
Mexia, 6,579—Limestone							
Brown Memorial Hospital.. Gen		Indiv	15	6	3	19	214
Midland, 5,484—Midland							
Midland Clinic-Hospital.....	Gen	Indiv	12	4	1	37	170
Ryan Hospital-Clinic.....	Gen	Indiv	12	6	4	35	200
Western Clinic Hospital.....	Gen	Part	15	4	6	64	210
Mineral Wells, 5,986—Palo Pinto							
Nazareth Hospital.....	Gen	Church	36	10	4	60	55
Nacogdoches, 5,637—Nacogdoches							
City Memorial Hospital.....	Gen	City	45	13	6	75	1,000
Navasota, 5,128—Grimes							
Brazos Valley Sanitarium.. Gen		Corp	22	8	4	61	114
New Braunfels, 6,242—Comal							
New Braunfels Hospital.....	Gen	Indiv	20	7	3	21	504
Newgulf, —Wharton							
Texas Gulf Sulphur Company Hospital.....	Gen	NPassn	23	7	2	46	57
Odessa, 2,407—Ector							
Headlee Hospital.....	Gen	Indiv	23	8	6	107	77
Orange, 7,913—Orange							
Frances Ann Litcher Hosp. Gen		Indiv	20	6	5	107	57
Paducah, 2,802—Cottle							
W. Q. Richards Memorial Hospital.....	Gen	Indiv	20	5	12	20	54
Palestine, 11,445—Anderson							
Missouri Pacific Lines Hosp.* ¹ Indus		NPassn	75	20	..	...	1,100
Palestine Sanitarium.....	Gen	Corp	22	6	3	54	100
Pampa, 10,470—Gray							
Worley Memorial Hospital.. Gen		Indiv	40	21	8	257	1,110
Paris, 15,640—Lamar							
George Griffiths Memorial Hospital for Children.....	Unit of	Sanitarium of Paris					
Lamar County Hospital.....	Gen	County	25	21	7	115	1,000
St. Joseph's Hospital* ⁴	Gen	Church	60	8	6	100	1,000
Sanitarium of Paris* ⁴	Gen	Corp	72	60	7	64	1,500
Pasadena, 1,647—Harris							
Pasadena Hosp. and Clinic. Gen		Part	20	9	5	151	64
Pecos, 3,204—Reeves							
Camp and Camp Hospital.. Gen		Part	20	6	4	61	100
Phillips, 2,500—Hutchinson							
Pantex Hospital of the Phillips Petroleum Co.....	Gen	NPassn	12	4	3	60	50
Plainview, 5,524—Hale							
Plainview Sanitarium and Clinic.....	Gen	Part	50	22	6	157	1,200

Key to symbols and abbreviations is on page 1195

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Port Arthur, 50,902—Jefferson							
St. Mary's Hospital, Gates Memorial ¹	Gen	Church	175	64	20	623	3,100
Prairie View, 10—Waller							
Prairie View Hospital ¹	Gen	State	50	30	4	45	975
Quannah, 4,464—Hardeman							
Memorial Hospital.....	Gen	County	40	12	8	77	918
Ranger, 6,208—Eastland							
City-County Hospital.....	Gen	CyCo	30	20	3	42	500
West Texas Clinic Hospital. Gen		Corp	18	8	2	63	263
Rio Grande City, 2,283—Starr							
Station Hospital.....	Gen	Army	30	6	2	21	243
Robstown, 4,183—Nueces							
Robstown Clinic-Hospital... Gen		Corp	14	7	4	52	570
Roscoe, 1,250—Nolan							
Young Hospital.....	Gen	Indiv	24	6	5	81	500
Rosenberg, 1,941—Fort Bend							
Fort Bend Hospital.....	Gen	Corp	22	5	5	100	544
Rotan, 1,632—Fisher							
Callan Hospital.....	Gen	Part	16	6	5	98	672
Rusk, 3,859—Cherokee							
Rusk State Hospital.....	Ment	State	2,385 ¹	2,259	..	...	601
San Angelo, 25,308—Tom Green							
Clinic Hospital.....	Gen	Corp	45	29	12	248	1,792
St. John's Hospital ¹	Gen	Church	25	16	5	115	875
Shannon West Texas Memorial Hospital ¹	Gen	NPAasn	100	49	15	301	3,136
San Antonio, 231,542—Bexar							
Central Clinic Hospital.....	Gen	Indiv	10	4	3	34	178
Grace Lutheran Sanatorium for Tuberculosis.....	TB	Church	35	31	..	...	98
Dr. Kenney's Sanatorium.....	Gen	Indiv	35	5	8	30	300
Medical and Surgical Memorial Hospital ¹	Gen	NPAasn	115	68	15	439	3,850
Dr. Moody's Sanatorium.....	N&M	Corp	50	36	..	...	179
Nix Hospital ¹	Gen	Corp	145	103	24	459	4,956
Robert B. Green Memorial Hospital ¹	Gen	County	200	160	18	750	5,651
San Antonio State Hospital ¹ Ment		State	2,811 ¹	2,862	..	...	702
Santa Rosa Hospital ¹	Gen	Church	290	149	32	670	6,621
Station Hospital (Fort Sam Houston) ¹	Gen	Army	1,000	538	23	335	7,338
Woodmen of the World War Memorial Hospital ¹	TB	Frat	150	100	..	...	148
Sanatorium, 1,040—Tom Green							
State Tuberculosis Sanat... TB		State	1,000	825	..	...	2,247
San Marcos, 5,134—Bays							
Soldiers' and Sailors' Memorial Hospital.....	Gen	CyCo	25	4	2	31	290
Santa Anna, 1,882—Coleman							
Sealy Hospital ¹	Gen	Indiv	35	21	3	105	1,075
Sealy, 1,800—Austin							
Sealy Hospital.....	Gen	Indiv	9	4	2	46	324
Seguin, 5,225—Guadalupe							
Seguin Hospital.....	Gen	NPAasn	22	5	4	56	342
Seymour, 2,636—Baylor							
Baylor County Hospital....	Gen	County	16	7	4	251	369
Shamrock, 3,780—Wheeler							
Shamrock General Hospital. Gen		Indiv	25	9	5	60	435
Sher... St... W... Gen							
Shiner, 1,372—Lavaca							
Dr. Wagner's Hospital.....	Gen	Indiv	18	9	3	20	392
Slaton, 3,876—Lubbock							
Mersey Hospital.....	Gen	Church	50	12	6	32	450
Snyder, 3,608—Scurry							
Snyder General Hospital....	Gen	Corp	24	12	4	67	595
Spur, 1,820—Dickens							
Nichols Sanatorium.....	Gen	Indiv	20	4	4	16	160
Stamford, 4,095—Jones							
Stamford Sanatorium.....	Gen	Part	50	25	10	255	1,527
Stephenville, 3,044—Erath							
Stephenville Hospital.....	Gen	NPAasn	35	14	3	79	940
Sugar Land, 1,840—Fort Bend							
Laura Eldridge Hospital... Gen		NPAasn	30	20	6	74	637
Sweetwater, 10,848—Nolan							
Sweetwater Hospital.....	Gen	City	40	16	8	143	1,541
Taylor, 7,463—Williamson							
Stromberg Clinic and Hosp. Gen		Corp	20	9	3	45	474
Wedemeyer Hospital.....	Gen	Corp	25	10	4	60	521
Teague, 3,509—Freestone							
Davidson Sanatorium.....	Gen	Indiv	20	5	3	63	378
Temple, 15,345—Bell							
Gulf, Colorado and Santa Fe Hospital ¹	Indus	NPAasn	150	40	..	...	1,398
Kings Daughters Hosp. ¹	Gen	NPAasn	110	62	6	93	3,160
Scott and White Hosp. ¹	Gen	Corp	169	113	6	91	3,490
Woodson Eye, Ear, Nose and Throat Hospital.....	EXT	Part	13	3	..	...	...
Terrell, 5,795—Kaufman							
Alexander Hospital.....	Gen	Indiv	25	2	4	37	631
Terrell State Hospital.....	Ment	State	2,674 ¹	2,640	..	...	483
Texarkana, 16,602—Bowie							
Texarkana Hospital ¹	Gen	NPAasn	50	23	7	156	1,830
Timpen, 1,545—Shelby							
Timpen Hospital and Clinic	Gen	Indiv	12	6	3	81	449
Tyler, 17,113—Smith							
Bryant Clinic and Sanit....	Gen	Part	15	14	3	83	976
Mother Frances Hospital ¹ ..	Gen	Church	66	23	16	210	1,661

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Uvalde, 5,286—Uvalde							
Merritt Hospital.....	Gen	Indiv	11	7	3	50	350
Vernon, 9,137—Wilbarger							
Christ the King Hospital... Gen		Church	21	4	3	33	285
Moore Brothers' Hospital... Gen		Indiv	15	6	2	20	359
Vernon Sanatorium.....	Gen	Indiv	24	...No data supplied			
Victoria, 7,421—Victoria							
De Tar Memorial Hospital.. Gen		Indiv	28	12	6	123	708
Victoria Hospital.....	Gen	Corp	22	9	7	74	540
Waco, 52,842—McLennan							
Hillcrest Memorial Hospital Gen		Church	77	35	12	273	1,706
Men's Hospital, Baylor Univ. Gen		Church	15	3	..	...	152
Providence Hospital ¹	Gen	Church	140	70	20	560	4,558
Veterans Admin. Facility ¹ ..	Ment	Vet	1,122	976	..	...	547
Waxahachie, 8,042—Ellis							
Waxahachie Sanitarium ¹ .. Gen		NPAasn	30	16	2	68	684
Weatherford, 4,912—Parker							
Medical and Surgical Clinic. Gen		Part	10	4	4	64	270
Wellington, 3,570—Collingsworth							
St. Joseph's Hospital.....	Gen	Church	20	4	4	60	470
Wharton, 2,691—Wharton							
Caney Valley Hospital.....	Gen	Corp	22	13	5	79	697
Wheeler, 931—Wheeler							
Wheeler Hospital.....	Gen	Part	12	5	3	126	453
Wichita Falls, 43,690—Wichita							
Bethania Hospital ¹	Gen	Church	34	16	8	320	1,370
Wichita Falls Clinic Hosp. ¹ ..	Gen	Part	80	51	6	189	2,741
Wichita Falls State Hospital Ment		State	2,362 ¹	2,371	..	...	779
Wichita General Hospital ¹ .. Gen		CyCo	140	75	8	395	3,529
Yoakum, 5,656—Lavaca							
Huth Memorial Hospital....	Gen	Church	35	10	10	30	300
Yorktown, 1,882—De Witt							
Allen Hospital.....	Gen	Indiv	12	3	3	4	216
Related Institutions							
Arlington, 3,661—Tarrant							
Knights Templar Hospital..	Inst	Frat	25	18	..	...	147
Austin, 53,120—Travis							
Austin State School.....	McDe	State	1,546 ¹	...No data supplied			
Oaks Sanatorium.....	N&M	Corp	25	11	..	...	60
Texas Confederate Home Hospital.....	Inst	State	100	20	..	...	53
Bellville, 1,533—Austin							
Bellville Hospital.....	Gen	Part	8	4	2	53	382
Clarendon, 2,756—Donley							
Adair Hospital.....	Gen	County	15	3	4	28	128
College Station, 1,500—Brazos							
Agricultural and Mechanical College Hospital.....	Inst	State	125	48	..	...	2,109
Columbus, 2,054—Colorado							
John E. Bell Memorial Hosp. Gen		Indiv	10	4	2	28	186
Dallas, 260,475—Dallas							
Virginia K. Johnson Home and School.....	Mnt	Church	35	28	10	41	47
Ennis, 7,069—Ellis							
Municipal Hospital.....	Gen	City	20	5	2	75	337
Fort Worth, 163,447—Tarrant							
Elmwood Sanatorium.....	TB	CyCo	56	56	..	...	36
Howard Sanatorium.....	N&M	Indiv	14	7	..	...	37
Hallettsville, 1,406—Lavaca							
Dufner Hospital.....	Gen	Indiv	8	5	2	10	80
Houston, 292,352—Harris							
Keightley Hospital.....	N&M	Indiv	40	25	..	...	152
Huntsville, 5,028—Walker							
Texas State Prison Hospital	Inst	State	161	116	..	...	4,508
Hutchins, 400—Dallas							
City - County Convalescent Hospital.....	Conv	CyCo	250	206	..	...	133
Luling, 5,970—Caldwell							
Luling Hospital.....	Gen	Part	12	5	2	30	260
Marlin, 5,338—Falls							
Crippled Children Hospital..	Orth	NPAasn	36	24	..	...	454
Memphis, 4,257—Hall							
Odom-Goodall Hospital....	Gen	Part	15	4	3	35	451.
Mt. Vernon, 1,222—Franklin							
Crutcher Hospital.....	Gen	NPAasn	10	2	2	10	94
Nixon, 1,037—Gonzales							
Crest View Hospital.....	Gen	Indiv	8	3	2	20	124
Odessa, 2,407—Ector							
Wood Hospital.....	Gen	Indiv	10	1	4	69	312
Pearsall, 2,536—Frio							
J. E. Beall's Day Hospital..	Gen	Indiv	10	2	4	21	122
Pecos, 3,304—Reeves							
Pecos Sanatorium.....	Gen	Indiv	10	3	2	49	183
Poteet, 1,231—Atascosa							
Shotts Memorial Hospital..	Gen	Indiv	9	...	3	49	252
San Antonio, 231,542—Bexar							
Dr. Farmer's Sanatorium... TB		Indiv	20	9	..	...	18
Medical Arts Hospital.....	Gen	Corp	31	21	5	100	1,821
Physicians and Surgeons Hospital ¹	Gen	Corp	60	34	12	309	1,737
Salvation Army Women's Home.....	Mat	Church	11	10	18	50	62
Station Hospital (Brooks Field).....	Gen	Army	18	3	..	...	105
Shamrock, 3,780—Wheeler							
Shamrock Clinic Hospital... Gen		Part	14	5	3	85	347
Southton, 89—Bexar							
Bexar County Tuberculosis Colony.....	TB	County	80	...No data supplied			

Key to symbols and abbreviations is on page 1195

UTAH

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
American Fork, 3,047—Utah American Fork Community Hospital	Gen	City	16	8	10	129	331
Bingham Canyon, 3,248—Salt Lake Bingham Canyon Hospital..	Gen	Indiv	35	19	6	40	507
Brigham, 5,093—Box Elder Cooley Memorial Hospital..	Gen	NPAasn	18	10	12	193	722
Cedar City, 3,615—Iron Iron County Hospital.....	Gen	County	39	16	12	250	1,015
Fort Douglas, 1,071—Salt Lake Station Hospital	Gen	Army	70	42	..	..	681
Fort Duchesne, 104—Uintah Uintah and Ouray Agency Indian Hospital	Gen	IA	29	19	6	59	561
Heber, 2,477—Wasatch Heber Hospital	Gen	Indiv	9	..	..	..	No data supplied
Lehi, 2,826—Utah Lehi Hospital	Gen	City	15	7	10	112	286
Logan, 9,979—Cache Cache Valley General Hosp..	Gen	NPAasn	51	25	16	238	813
William Budge Memorial Hospital*o	Gen	NPAasn	66	34	18	291	4,020
Moab, 853—Grand Grand County Public Hosp. Gen	Gen	County	15	8	6	68	288
Ogden, 40,272—Weber Thomas D. Dee Memorial Hospital*ao	Gen	Church	204	146	36	1,269	6,066
Utah State Tuberculosis Sanatorium	TB	State	104	..	..	..	Estab. 1939
Park City, 4,281—Summit Park City Miners' Hospital. Gen	Gen	NPAasn	45	10	4	50	347
Payson, 3,045—Utah Payson City Hospital.....	Gen	NPAasn	35	11	12	169	735
Price, 4,084—Carbon Price City Hospital.....	Gen	City	55	31	12	232	1,087
Provo, 14,760—Utah Utah State Hospital.....	Ment	State	1,086 ¹	1,016	..	..	345
Utah Valley Hospital.....	Gen	NPAasn	52	..	12	..	Estab. 1939
Richfield, 3,067—Sevier Sevier Valley Hospital.....	Gen	Indiv	20	..	5	..	Reopened
St. George, 2,434—Washington D. A. McGregor Hospital... Gen	Gen	Indiv	27	13	5	108	453
Salina, 1,383—Sevier Salina Hospital	Gen	Corp	18	7	6	63	253
Salt Lake City, 140,267—Salt Lake Dr. W. H. Groves Latter-Day Saints Hospital*ao... Gen	Gen	Church	374	259	80	1,693	8,319
Holy Cross Hospital*ao... Gen	Gen	Church	200	170	50	965	4,170
Primary Children's Hospital Chil	Gen	Church	25	18	..	..	97
St. Mark's Hospital*ao... Gen	Gen	Church	150	124	14	345	3,405
Salt Lake County General Hospital*ao	Gen	County	237	153	21	533	4,211
Shriners Hospital for Crippled Children	Orth	Frat	20	20	..	..	69
Veterans Admin. Facility*o... Gen	Gen	Vet	104	99	..	..	877
Spanish Fork, 3,727—Utah Hughes Memorial Hospital.. Gen	Gen	Indiv	12	3	5	13	197
Tremonton, 1,099—Box Elder Valley Hospital	Gen	NPAasn	20	8	6	108	417

Related Institutions

American Fork, 3,047—Utah Utah State Training School. MeDe	State	390 ¹	450	..	..	..	90
Kanab, 1,195—Kane Kanab Hospital	Gen	Indiv	10	5	5	79	234
Murray, 5,172—Salt Lake Cottonwood Stake Maternity Hospital	Mat	Church	26	17	26	590	617

VERMONT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Barre, 11,507—Washington Barre City Hospital*o... Gen	Gen	NPAasn	70	40	15	236	1,540
Washington County Sanat.. TB	TB	State	47	40	..	..	47
Bellows Falls, 3,920—Windham Rockingham General Hosp.*o Gen	Gen	NPAasn	38	26	9	143	945
Bennington, 7,300—Bennington Henry W. Putnam Memorial Hospital	Gen	NPAasn	86	56	20	243	1,438
Brattleboro, 8,700—Windham Brattleboro Memorial Hospital*o	Gen	NPAasn	75	40	12	155	2,331
Brattleboro Retreat	Ment	Corp	900	784	..	..	376
Burlington, 24,759—Chittenden Bishop DeGoesbriand Hospital*ao	Gen	Church	110	96	12	202	3,747
Green Mountain Sanatorium IntMed	Indiv	14	5	..	..	..	110
Lakerew Sanatorium	N&M	Corp	25	11	..	..	75
Mary Fletcher Hospital*+ao Gen	Gen	NPAasn	135	115	15	556	5,616
Fort Ethan Allen, 106—Chittenden Station Hospital	Gen	Army	116	101	..	6	1,507
Hardwick, 1,077—Caledonia Hardwick Hospital	Gen	NPAasn	12	5	4	24	220

VERMONT—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Middlebury, 2,003—Addison Porter Memorial Hospital*o... Gen	Gen	NPAasn	45	15	10	62	75
Montpelier, 7,837—Washington Heaton Hospital*ao	Gen	NPAasn	70	53	8	181	2,117
Morrisville, 1,822—Lamolle Copley Hospital	Gen	Corp	33	12	5	67	47
Newport, 5,034—Orleans Orleans County Memorial Hospital*o	Gen	Corp	33	24	7	81	69
Pittsford, 637—Rutland Vermont Sanatorium	TB	State	84	70	..	..	12
Proctor, 2,615—Rutland Proctor Hospital	Gen	NPAasn	35	12	7	60	49
Randolph, 1,957—Orange Gifford Memorial Hospital*o Gen	Gen	NPAasn	57	22	10	77	63
Rutland, 17,315—Rutland Rutland Hospital*o	Gen	NPAasn	140	90	20	410	2,712
St. Albans, 8,020—Franklin St. Albans Hospital*ao... Gen	Gen	NPAasn	50	37	8	116	1,478
St. Johnsbury, 7,920—Caledonia Brightlook Hospital*o	Gen	NPAasn	55	34	10	125	1,647
St. Johnsbury Hospital.....	Gen	Church	30	18	5	20	25
Springfield, 4,943—Windsor Springfield Hospital*o	Gen	NPAasn	30	24	6	169	87
Waterbury, 1,776—Washington Vermont State Hospital for the Insane	Ment	State	1,080 ¹	1,050	..	..	24
White River Junction, 3,271—Windsor Veterans Admin. Facility*o... Gen	Vet	110	80	..	..	..	81
Winooski, 5,308—Chittenden Fanny Allen Hospital*ao... Gen	Gen	Church	75	60	14	140	1,129

Related Institutions

Brandon, 1,731—Rutland Brandon State School.....	MeDe	State	393 ¹	349	..	..	6
Pittsford, 637—Rutland Caverly Preventorium	TB	NPAasn	77	64	..	..	131
Windsor, 3,689—Windsor Vermont State Prison Hosp. Inst	State	12	7	..	..	..	117
Windsor Hospital	Gen	NPAasn	14	10	6	64	319

VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Abingdon, 2,877—Washington Johnston Memorial Hosp.*o Gen	Gen	NPAasn	60	33	5	26	1,042
Alexandria, 24,149—Arlington Alexandria Hospital*o	Gen	NPAasn	100	73	23	521	3,119
Bedford, 3,713—Bedford Hartwell Hospital	Gen	Indiv	23	10	12	19	235
John Russell Hospital.....	Gen	Corp	23	7	4	12	125
Bristol, 8,840—Washington King's Mountain Memorial Hospital	Gen	NPAasn	40	26	3	235	1,751
Brook Hill, 50—Henrico Pine Camp Hospital.....	TB	City	286	198	..	..	131
Burkeville, 755—Nottoway Piedmont Sanatorium*o ... TB	TB	State	270	143	..	..	23
Catawba Sanatorium, 100—Roanoke Catawba Sanatorium*o ... TB	TB	State	400	334	..	..	45
Charlottesville, 15,245—Albemarle Blue Ridge Sanatorium*o... TB	TB	State	375	250	..	..	47
Martha Jefferson Hospital and Sanitarium*o	Gen	NPAasn	50	34	10	173	1,222
University of Virginia Hospital*+ao	Gen	State	367	257	44	765	9,221
Christiansburg, 1,970—Montgomery New Altamont Hospital.....	Gen	Corp	25	14	8	72	611
Clifton Forge, 6,839—Alleghany Chesapeake and Ohio Hospital*ao	Gen	NPAasn	135	89	8	73	2,225
Clintwood, 729—Dickenson Dickenson County Hospital. Gen	Gen	Indiv	29	8	3	62	73
Coeburn, 784—Wise Coeburn Hospital	Gen	Part	50	14	2	12	47
... .. Gen	Gen	Indiv	15	10	4	24	27
... .. Gen	Gen	NPAasn	25	12	2	16	66
Hilltop Sanatorium	TB	NPAasn	70	60	..	..	31
Memorial Hospital*o	Gen	NPAasn	115	95	14	56	1,679
Farmville, 3,133—Prince Edward Southside Community Hospital*ao	Gen	NPAasn	40	24	6	125	1,751
Fort Belvoir, —Fairfax Station Hospital	Gen	Army	40	24	..	..	125
Fort Myer, 1,050—Arlington Station Hospital	Gen	Army	84	29	..	..	90
Fortress Monroe, 1,265—Elizabeth City Station Hospital*o	Gen	Army	72	23	6	23	70
Franklin, 2,920—Southampton Ralford Hospital	Gen	Indiv	25	15	6	60	76
Fredericksburg, 6,519—Spotsylvania Mary Washington Hospital. Gen	Gen	NPAasn	85	20	19	212	2,135

VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Galax, 2,544—Grayson							
Galax Hospital and Clinic.. Gen	Corp		35	15	3	18	397
Grundy, 815—Buchanan							
Grundy Hospital	Indiv		60	23	5	30	871
Hampton, 8,332—Elizabeth City							
Dixie Hospital*..... Gen	NPAasn		75	30	10	148	1,202
Harrisonburg, 7,332—Rockingham							
Rockingham Memorial Hos- pital*..... Gen	NPAasn		134	100	11	281	4,387
Hopewell, 11,327—Prince George							
John Randolph Hospital.... Gen	Corp		25	6	6	72	358
Hot Springs, 1,500—Bath							
Community House	NPAasn		15	5	4	29	186
Keoughtan, 1,900—Elizabeth City							
Veterans Admin. Facility*... Gen	Vet		496	407	..	..	2,724
Langley Field, —Elizabeth City							
Station Hospital	Army		68	42	8	64	1,075
Lebanon, 560—Russell							
Lebanon General Hospital... Gen	Indiv		20	5	6	26	305
Leesburg, 1,640—Loudoun							
Loudoun County Hospital.. Gen	County		28	17	7	74	729
Lexington, 3,752—Rockbridge							
Stonewall Jackson Memorial Hospital	Gen	NPAasn	57	30	8	100	1,455
Luray, 1,459—Page							
Page Memorial Hospital.... Gen	NPAasn		13	3	4	40	317
Lynchburg, 40,661—Campbell							
Guggenheimer Memorial Hospital..... Unit of Marshall Lodge Memorial Hospital	City		112	62	21	297	2,128
Lynchburg General Hosp.*. Gen	Frat		135	71	15	311	2,677
Marshall Lodge Memorial Hospital	Church		100	48	16	260	1,752
Virginia Baptist Hospital*... Gen							
Lynnhaven, 250—Princess Anne							
Tidewater Memorial Hosp... TB	NPAasn		50	50	..	..	123
Marion, 4,156—Smyth							
Homeland Hospital	Indiv		15	6	3	24	350
Southwestern State Hosp.... Ment	State		1,547 ¹	1,235	..	..	400
Nassawadox, 1,000—Northampton							
Northampton-Acomac Me- morial Hospital	Counties		55	27	5	73	1,006
Newport News, 34,417—Warwick							
Elizabeth Buxton Hosp.**... Gen	Indiv		90	57	10	210	3,203
Riverside Hospital*..... Gen	NPAasn		100	62	14	334	2,517
Whittaker Memorial Hosp... Gen	NPAasn		44	14	6	28	563
Norfolk, 129,710—Norfolk							
Charles R. Grandy Sanat... TB	City		100	95	..	..	77
Henry A. Wise Hospital for Contagious Diseases	City		22	4	..	..	130
Hospital of St. Vincent de Paul*..... Gen	Church		228	118	22	251	4,479
Leigh Memorial Hospital*... Gen	NPAasn		47	40	11	190	1,387
Norfolk Community Hosp... Gen	NPAasn		54	21	11	73	684
Norfolk General Hosp.**... Gen	NPAasn		237	170	30	710	7,581
U. S. Marine Hospital*..... Gen	USPHS		360	244	..	..	3,376
Norton, 3,077—Wise							
Norton Hospital	Indiv		30	11	2	11	630
Pennington Gap, 1,553—Lee							
Lee General Hospital..... Gen	Corp		30	25	2	34	1,131
Petersburg, 28,554—Dinwiddie							
Central State Hospital..... Ment	State		3,388 ¹	3,528	..	..	896
Medical Center Hospital*.... Unit of Central State Hospital	NPAasn		72	49	7	100	2,005
Petersburg Hospital*..... Gen	State		250 ¹	167	..	..	221
Petersburg State Colony..... MeDe							
Portsmouth, 45,704—Norfolk							
Kings Daughters Hospital*... Gen	NPAasn		113	75	12	265	2,540
Norfolk Naval Hospital*..... Gen	Navy		745	421	15	295	5,824
Parrish Memorial Hosp.*..... Gen	Corp		40	25	10	175	1,018
Pulaski, 7,168—Pulaski							
Pulaski Hospital*..... Gen	Corp		60	31	5	114	1,455
Radford, 6,227—Montgomery							
St. Albans Sanatorium..... N&M	Part		46	42	..	..	308
Richlands, 1,355—Tazewell							
Clinch Valley Clinic Hosp... Gen	Corp		75	45	4	110	2,136
Mattie Williams Hospital... Gen	Indiv		75	43	8	80	1,635
Richmond, 182,929—Henrico							
Crippled Children's Hospital. Unit of Med. Col. of Va. Hospital Division	Corp		112	94	20	464	4,947
Dooley Hospital..... Unit of Med. Col. of Va. Hospital Division	Corp		80	63	12	400	3,430
Grace Hospital*..... Gen	Corp		112	94	20	464	4,947
Johnston-Willis Hospital*... Gen	Corp		112	94	20	464	4,947
Medical College of Virginia, Hospital Division**..... Gen	NPAasn		472	428	40	799	10,767
Memorial Hospital..... Unit of Med. Col. of Va. Hospital Division	NPAasn		90	48	10	313	2,173
Retreat for the Sick..... Gen	NPAasn		23	8	4	63	307
Richmond Community Hosp. Gen	Corp		50	43	..	1	1,390
St. Elizabeth's Hospital*..... Gen	Corp		81	76	15	342	2,396
St. Luke's Hospital*..... Gen	Corp		75	55	7	136	1,333
St. Philip Hospital*..... Unit of Med. Col. of Va. Hospital Division	NPAasn		78	55	7	136	1,333
Sheltering Arms Hospital*... Gen	Corp		53	71	12	323	2,825
Stuart Circle Hospital*..... Gen	Corp		50	25	..	..	445
Tucker Sanatorium..... N&M	Corp		133	90	..	..	593
Westbrook Sanatorium..... N&M	Corp						
Roanoke, 9,206—Roanoke							
Burrell Memorial Hospital*... Gen	NPAasn		40	21	4	70	637
Gill Memorial Eye, Ear and Throat Hospital*..... ENT	NPAasn		25	7	..	..	719
Jefferson Hospital**..... Gen	NPAasn		111	62	12	273	3,603
Lewis-Gale Hospital*..... Gen	NPAasn		122	66	12	145	3,174
Roanoke City Tuberculosis Sanatorium	TB	City	60	..	..	..	Estab. 1910

VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Roanoke Hospital*..... Gen	NPAasn		100	46	10	361	2,341
Shenandoah Hospital*..... Gen	Corp		50	25	9	185	1,757
Veterans Admin. Facility*... Ment	Vet		1,008	1,042	..	..	933
Salem, 4,833—Roanoke							
Mount Regis Sanatorium.... TB	Indiv		20	..	..	..	55
Saltville, 2,964—Smyth							
Mathieson Hospital	Gen	NPAasn	15	6	3	18	343
South Boston, 4,841—Halifax							
South Boston Hospital..... Gen	Indiv		36	18	4	45	667
Staunton, 11,990—Augusta							
Kings Daughters Hospital*... Gen	NPAasn		82	38	10	118	1,225
Stuart, 588—Patrick							
Stuart Hospital	Gen	Indiv	20	7	2	18	241
Suffolk, 10,271—Nansemond							
Lakeview Hospital*..... Gen	Corp		55	31	6	75	1,150
Virginia General Hospital... Gen	NPAasn		25	10	5	51	368
University, —Albemarle							
University of Virginia Hosp. See Charlottesville							
Warrenton, 1,450—Fauquier							
Fauquier County Hospital.. Gen	NPAasn		28	10	5	30	333
Waynesboro, 6,226—Augusta							
Waynesboro Community Hospital	Gen	NPAasn	35	10	6	93	1,095
Williamsburg, 3,778—James City							
Bell Hospital	Gen	Indiv	17	5	2	34	898
Eastern State Hospital..... Ment	State		1,793 ¹	1,717	..	..	545
Winchester, 10,855—Frederick							
Winchester Memorial Hos- pital*..... Gen	NPAasn		122	71	14	331	2,870
Related Institutions							
Beaumont, —Powhatan							
Virginia Industrial School for Boys	Inst	State	21	6	..	..	330
Colony, 100—Amherst							
Medical Center Hospital*.... Unit of State Colony for Epileptics and Feebleminded							
State Colony for Epileptics and Feebleminded	MeDe	State	1,450 ¹	1,352	..	..	243
Danville, 22,247—Pittsylvania							
Providence Hospital	Gen	Corp	39	10	2	15	470
Falls Church, 2,019—Fairfax							
Gundry Home and Training School for Feebleminded.. MeDe	Indiv		80	72	..	..	12
Lawrenceville, 1,629—Brunswick							
Loulie Taylor Letcher Me- morial Hospital	Inst	Church	24	2	..	..	130
Martinsville, 7,705—Henry							
St. Mary Hospital	Gen	Indiv	14	2	2	21	152
Shackelford Hospital	Gen	Indiv	50	30	8	67	1,219
Norfolk, 129,710—Norfolk							
McCoy-Stokes Hospital..... ENT	Part		11	3	..	..	272
Richmond, 182,929—Henrico							
City Home	InstGen	City	565	433	36	92	1,022
Lee Camp Soldiers' Home							
Penitentiary Hospital	Inst	State	16	7	..	..	5
State Farm, 60—Goochland							
State Farm Hospital..... Inst	State		50	30	..	..	996
Staunton, 11,990—Augusta							
DeJarnette Sanatorium..... Unit of Western State Hospital	Ment	State	2,388 ¹	2,410	..	..	1,181
Western State Hospital..... Ment							
Stonema, 251—Wise							
Stonema Hospital	Indus	NPAasn	18	6	..	..	130
Sweet Briar, 200—Amherst							
Sweet Briar College In- firmery	Inst	NPAasn	16	1	..	..	150

WASHINGTON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Aberdeen, 21,723—Grays Harbor							
St. Joseph's Hospital*..... Gen	Church		77	50	18	530	2,345
American Lake, 800—Pierce							
Veterans Admin. Facility*... Ment	Vet		710	647	..	..	277
Anacortes, 6,564—Skagit							
Anacortes Hospital	Gen	Corp	25	8	5	69	462
Auburn, 3,906—King							
Suburban Hospital	Gen	Corp	40	11	6	61	463
Bellingham, 30,823—Whatcom							
St. Frances Hospital	Gen	Indiv	17	9	4	50	320
St. Joseph's Hospital*..... Gen	Church		100	64	15	376	2,108
St. Luke's General Hosp.*... Gen	NPAasn		70	40	12	257	1,883
Whatcom County Hospital and Infirmary	Gen	County	40	22	9	129	1,007
Bremerton, 10,170—Kitsap							
U. S. Naval Hospital*..... Gen	Navy		290	150	8	143	2,104
Centralia, 6,053—Lewis							
St. Luke's Hospital and Sweet Clinic	Gen	Part	25	12	8	141	601
Chehalis, 4,907—Lewis							
St. Helen's Hospital..... Gen	Church		20	14	6	160	690
Chewelah, 1,315—Sierens							
St. Joseph's Hospital..... Gen	Church		20	8	6	75	490
Colfax, 2,782—Whitman							
St. Ignatius Hospital*..... Gen	Church		60	42	10	180	1,747

Key to symbols and abbreviations is on page 1195

WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Colville, 1,803—Stevens							
Mt. Carmel Hospital.....	Gen	Indiv	23	11	6	92	575
Dayton, 2,528—Columbia							
John Brining Memorial							
Hospital.....	Gen	Indiv	20	12	4	77	447
Ellensburg, 4,621—Kittitas							
Ellensburg General Hosp. A.....	Gen	Corp	25	16	8	108	667
Elma, 1,545—Grays Harbor							
Elma General Hospital.....	Gen	Indiv	13	6	7	53	549
Oakhurst Sanatorium.....	TB	County	65	66	..	..	81
Everett, 30,567—Snohomish							
General Hospital A.....	Gen	NPAasn	84	49	16	323	3,015
Providence Hospital A.....	Gen	Church	109	60	21	410	2,110
Forks, 600—Clallam							
Olympic Hospital.....	Gen	Indiv	28	7	3	24	425
Fort Lewis, —Pierce							
Station Hospital A.....	Gen	Army	150	115	4	21	2,839
Fort Steilacoom, 2,050—Pierce							
Western State Hospital A.....	Ment	State	2,766 ¹	2,566	..	..	782
Fort Worden (Port Townsend P.O.), 387—Jefferson							
Station Hospital.....	Gen	Army	40	13	2	20	347
Kirkland, 1,714—King							
Kirkland Hospital.....	Gen	Indiv	12	5	5	67	251
Lakeview, 300—Pierce							
Mountain View Sanatorium. TB		County	130	115	..	..	176
Leavenworth, 1,415—Chelan							
Cascade Sanatorium.....	Gen	NPAasn	35	..	No data supplied		
Longview, 10,652—Cowlitz							
Cowlitz General Hospital... Gen		NPAasn	45	24	13	235	1,223
Longview Memorial Hospital Gen		Corp	60	32	16	254	1,614
Mason City, —Okanogan							
Mason City Hospital.....	Gen	Corp	55	37	15	254	2,067
Medical Lake, 1,671—Spokane							
Eastern State Hospital A.....	Ment	State	2,034 ¹	1,810	..	..	407
Mt. Vernon, 3,690—Skagit							
Mt. Vernon General Hosp... Gen		Indiv	30	10	6	72	511
Nespelem, 125—Okanogan							
Colville Indian Hospital.....	Gen	IA	42	31	4	..	736
Newport, 1,050—Pend Oreille							
Newport Community Hosp.. Gen		NPAasn	20	8	4	60	352
Olympia, 11,733—Thurston							
St. Peter's Hospital A.....	Gen	Church	100	55	15	280	2,866
Pasco, 3,496—Franklin							
Our Lady of Lourdes Hos- pital A.....	Gen	Church	65	35	12	201	1,325
Port Angeles, 10,188—Clallam							
Davidson and Hay Hospital Gen		Part	50	16	10	100	944
Port Angeles Gen. Hosp. A.....	Gen	NPAasn	90	60	12	197	3,610
Port Gamble, 500—Kitsap							
McCormick General Hosp... Gen		Indiv	14	6	2	34	234
Port Townsend, 3,970—Jefferson							
St. John's Hospital.....	Gen	Church	80	32	12	95	783
Puyallup, 7,094—Pierce							
Puget Sound Sanatorium.... N&M		Indiv	20	13	..	..	80
Puyallup General Hospital. Gen		Part	24	11	8	110	600
Renton, 4,062—King							
Bronson Memorial Hospital Gen		Indiv	33	6	6	72	333
Richmond Highlands, 600—King							
Richland Sanatorium and Iso- lation Hospital A.....	TbIso	City	250	229	..	..	167
Seattle, 365,583—King							
Ballard General Hospital... Gen		NPAasn	30	17	12	135	825
Children's Orthopedic Hos- pital A.....	Orth	NPAasn	132	90	..	..	1,325
Columbus Hospital A.....	Gen	Church	200	83	30	370	2,693
Firldawn Sanatorium.....	N&M	Corp	24	15	..	..	34
King County Hospital, Unit No. 1 (Harborview) A.....	Gen	County	394	372	51	1,132	11,567
King County Tuberculosis Hospital.....	TB	County	160	157	..	..	132
Laurel Beach Sanatorium... TB		Part	85	79	..	..	185
Maynard Hospital A.....	Gen	NPAasn	100	81	35	683	2,831
Meadows Sanatorium.....	N&M	Corp	35	22	..	..	100
Medical and Dental Building							
Surgery.....	Surg	Indiv	15	7	..	..	..
Providence Hospital A.....	Gen	Church	327	209	53	925	7,869
Riverton Hospital for Chest Diseases.....	TB	NPAasn	61	65	..	..	92
Seattle General Hospital A.....	Gen	NPAasn	100	67	20	384	3,605
Station Hospital.....	Gen	Army	28	8	..	..	251
Swedish Hospital A.....	Gen	NPAasn	255	202	63	1,000	6,914
U. S. Marine Hospital A.....	Gen	USPHS	400	333	..	8	3,245
Virginia Mason Hospital A.....	Gen	NPAasn	143	103	30	449	4,085
Sedro Woolley, 2,719—Skagit							
Memorial Hospital.....	Gen	NPAasn	30	15	7	145	501
Northern State Hospital A.....	Ment	State	1,981 ¹	1,936	..	..	401
Shelton, 3,091—Mason							
Shelton General Hospital A.....	Gen	NPAasn	45	23	15	195	1,215
.. TB		County	57	54	..	..	39
.. al Gen		Indiv	16	10	4	62	306
..							
Snoquaunne Falls Ho..... Gen		Indiv	50	12	8	26	412
South Bend, 1,798—Pacific							
South Bend General Hosp... Gen		Part	20	6	5	38	163
Spokane, 115,514—Spokane							
Deaconess Hospital A.....	Gen	Church	155	113	20	732	5,108
Edgelynn Sanatorium.....	TB	County	149	105	..	..	91
Sacred Heart Hospital A.....	Gen	Church	550	277	50	1,187	9,508
St. Luke's Hospital A.....	Gen	NPAasn	160	106	18	227	3,823

WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Salvation Army Women's Hospital and Home.....	Mat	Church	46	23	23	18	9
Shriners Hospital for Crip- pled Children A.....	Orth	Frat	24	20	..	..	..
Station Hospital A.....	Gen	Army	76	40	..	..	..
Stanwood, 715—Snohomish							
Stanwood General Hospital. Gen		Indiv	14	6	3	4	75
Tacoma, 106,817—Pierce							
Northern Pacific Beneficial Association Hospital A.....	Gen	NPAasn	111	53	9	4	25
Pierce County Hospital A.....	Gen	County	193	163	22	51	12
St. Joseph's Hospital A.....	Gen	Church	279	85	33	63	42
Tacoma General Hospital A.....	Gen	NPAasn	185	128	35	84	312
Tacoma Hospital A.....	Gen	Tb IA	263	219	..	..	..
Toppenish, 2,774—Yakima							
Yakima Sanatorium.....	TB	IA	37	29	..	..	..
Vancouver, 15,766—Clark							
Clark County Hospital.....	Gen	County	35	34	8	3	71
Clark General Hospital.....	Gen	NPAasn	40	21	12	17	12
St. Joseph's Hospital.....	Gen	Church	100	47	20	22	10
Station Hospital A.....	Gen	Army	114	65	..	..	..
Walla Walla, 15,976—Walla Walla							
St. Mary's Hospital A.....	Gen	Church	85	32	15	28	173
Veterans Admin. Facility A.....	Gen	Tb Vet	400	335	..	..	..
Walla Walla Sanitarium and Hospital A.....	Gen	Church	50	25	9	12	75
Wenatchee, 11,627—Chelan							
Central Washington Deacon- ess Hospital A.....	Gen	Church	50	35	14	25	163
St. Anthony's Hospital A.....	Gen	Church	75	39	20	27	16
Yakima, 22,101—Yakima							
St. Elizabeth's Hospital A.....	Gen	Church	164	135	30	90	77
Yakima County Hospital... Gen		County	148	95	13	28	15

Related Institutions

Chehalis, 4,907—Lewis							
State Training School for Boys.....	Inst	State	24	2	..	..	..
Cle Elum, 2,508—Kittitas							
Roslyn Cle Elum Beneficial Company Hospital.....	Gen	NPAasn	20	14	1	7	2
Ione, 594—Pend Oreille							
Ione Hospital.....	Gen	Indiv	11	4	3	19	14
Medical Lake, 1,671—Spokane							
Eastern State Custodial School.....	MeDe	State	1,488 ¹	1,640	..	..	..
Monroe, 1,570—Snohomish							
Snohomish County Hospital and Farm.....	InstGen	County	43	38	4	15	2
Mt. Vernon, 3,690—Skagit							
Rowley General Hospital... Gen		Indiv	35	17	8	14	7
Seattle, 365,583—King							
Florence Crittenton Home... Mat		NPAasn	27	18	15	30	4
Freedlander's Sanitarium... Conv		Indiv	11	6	..	..	..
Junior League Convalescent Home.....	Conv	NPAasn	20	18	..	..	..
King County Hospital, Unit No. 2 (Georgetown Br.).. InstChr		County	275	252	..	..	..
Shadel Sanitarium.....	Alcoh	Corp	14	4	..	..	..
University of Washington Health Center.....	Inst	State	75	17	..	..	..
Spokane, 115,514—Spokane							
Florence Crittenton Home... Mat		NPAasn	19	2	6	22	4
Rivercrest Hospital.....	Iso	City	100	6	..	..	..
Steilacoom, 722—Pierce							
U. S. Penitentiary Hospital A.....	Inst	Fed	85	63	..	..	..
Tacoma, 106,817—Pierce							
Washington Minor Hospital Gen		NPAasn	14	10	..	..	..
White Shield Home.....	Mat	NPAasn	20	19	10	40	6
Tulalip, 100—Snohomish							
Tulalip Hospital.....	Gen	IA	9	9	3	4	5
Walla Walla, 15,976—Walla Walla							
Blue Mountain Sanatorium. TB		County	36	28	..	..	..

WEST VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Beckley, 9,337—Raleigh							
Beckley Hospital.....	Gen	Part	160	122	10	12	10
Pinecrest Sanitarium A.....	TB	State	476	371	..	..	..
Raleigh General Hospital A.....	Gen	Corp	60	45	7	3	15
Bluefield, 19,359—Mercer							
Bluefield Sanitarium A.....	Gen	Corp	109	76	10	16	6
Brown's Hospital.....	Gen	Indiv	47	23	12	6	6
Providence Hospital.....	Gen	Indiv	11	11	3	1	1
St. Luke's Hospital.....	Gen	Corp	115	59	8	9	9
Buckhannon, 4,374—Upshur							
St. Joseph's Hospital.....	Gen	Church	41	20	6	7	7
Charleston, 69,405—Kanawha							
Charleston Gen. Hosp. A.....	Gen	NPAasn	255	184	29	20	14
Kanawha Valley Hosp. A.....	Gen	Corp	123	95	12	14	14
McMillan Hospital A.....	Gen	Corp	80	51	19	14	14
Mountain State Hospital A.....	Gen	Corp	77	54	19	14	14
St. Francis Hospital A.....	Gen	Church	100	67	14	14	14
Salvation Army Hospital... Gen		Church	28	15	4	5	5
Staats Hospital.....	Gen	Corp	46	26	6	6	6

Key to symbols and abbreviations is on page 1195

WEST VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Charles Town, 2,434—Jefferson	Gen	NPAssn	25	7	6	31	343
Charles Town General Hosp.	Gen	NPAssn	25	7	6	31	343
Clarksburg, 28,866—Harrison	Gen	Church	150	80	15	221	2,972
St. Mary's Hospital	Gen	NPAssn	52	42	10	201	1,723
Union Protestant Hospital	Gen	NPAssn	52	42	10	201	1,723
Denmar, —Pocahontas	TB	State	100	70	..	..	115
Denmar Sanatorium	TB	State	100	70	..	..	115
Elkins, 7,345—Randolph	Gen	NPAssn	115	56	10	72	2,248
Davis Memorial Hospital	Gen	NPAssn	65	25	6	44	959
Elkins City Hospital	Gen	Corp	65	25	6	44	959
Fairmont, 23,159—Marion	Gen	NPAssn	120	81	10	319	3,050
Cook Hospital	Gen	State	68	51	5	22	1,183
Fairmont Emergency Hosp.	Gen	State	68	51	5	22	1,183
Glen Dale, 1,493—Marshall	Gen	Church	75	25	10	159	906
Reynolds Memorial Hosp.	Gen	Church	75	25	10	159	906
Hinton, 6,654—Summers	Gen	Corp	67	31	4	28	1,172
Hinton Hospital	Gen	Corp	67	31	4	28	1,172
Holden, 4,000—Logan	Gen	Corp	30	9	1	11	529
Holden Hospital	Gen	Corp	30	9	1	11	529
Hopemont, 300—Preston	Unit of Hopemont Sanitarium	State	475	477	..	..	282
Conley Hospital	Unit of Hopemont Sanitarium	State	475	477	..	..	282
Hopemont Sanitarium	Unit of Hopemont Sanitarium	State	475	477	..	..	282
Huntington, 75,572—Cabell	Gen	NPAssn	110	103	20	45	2,899
Chesapeake and Ohio Hospital	Gen	NPAssn	110	103	20	45	2,899
Huntington Memorial Hospital	Gen	NPAssn	115	69	22	154	2,015
Huntington Orthopedic Hospital	Orth	NPAssn	50	24	..	..	523
Moore-Beckner Eye, Ear and Throat Hospital	ENT	Part	5	3	..	..	485
St. Mary's Hospital	Gen	Church	194	124	26	710	4,991
Veterans Admin. Facility	Gen	Vet	317	193	..	..	1,991
Keyser, 6,248—Mineral	Gen	Corp	50	28	8	104	1,054
Potomac Valley Hospital	Gen	Corp	50	28	8	104	1,054
Kingwood, 1,709—Preston	Gen	Corp	10	..	3	Estab.	1939
Kercheval Memorial Clinic	Gen	Corp	10	..	3	Estab.	1939
Lakin, 50—Mason	Ment	State	400 ¹	380	..	..	92
Lakin State Hospital	Ment	State	400 ¹	380	..	..	92
Logan, 4,390—Logan	Gen	Corp	100	40	8	76	1,993
Logan General Hospital	Gen	Corp	100	40	8	76	1,993
Mercy Hospital	Gen	Corp	75	50	12	..	634
Marlinton, 1,586—Pocahontas	Gen	County	35	15	4	28	509
Pocahontas Memorial Hosp.	Gen	County	35	15	4	28	509
Martinsburg, 14,857—Berkeley	Gen	NPAssn	75	30	10	51	657
City Hospital	Gen	NPAssn	65	38	6	106	1,303
Kings Daughters Hosp.	Gen	NPAssn	65	38	6	106	1,303
Matewan, 932—Mingo	Gen	Indiv	42	12	1	35	875
Matewan Clinic Hospital	Gen	Indiv	42	12	1	35	875
McKendree, 80—Fayette	Gen	State	60	38	5	22	1,089
McKendree Emergency Hospital	Gen	State	60	38	5	22	1,089
Milton, 1,305—Cabell	Conv	NPAssn	75	33	..	..	194
Morris Memorial Hospital for Crippled Children	Conv	NPAssn	75	33	..	..	194
Montgomery, 2,906—Fayette	Gen	Corp	127	77	8	78	3,375
Laird Memorial Hospital	Gen	Corp	127	77	8	78	3,375
Morgantown, 16,186—Monongalia	Gen	Indiv	71	19	11	120	1,700
City Hospital	Gen	Indiv	71	19	11	120	1,700
Monongalia General Hosp.	Gen	County	75	43	8	134	1,330
Mullens, 2,356—Wyoming	Gen	Indiv	35	10	2	12	407
Wyle Hospital	Gen	Indiv	35	10	2	12	407
New Martinsville, 2,514—Wetzel	Gen	NPAssn	35	18	5	50	720
Wetzel County Hospital	Gen	NPAssn	35	18	5	50	720
Oak Hill, 2,076—Fayette	Gen	Part	45	33	5	30	2,147
Oak Hill Hospital	Gen	Part	45	33	5	30	2,147
Parkersburg, 29,623—Wood	Gen	City	165	70	20	251	2,585
Camden—Clark Memorial Hospital	Gen	City	125	78	10	180	2,513
St. Joseph's Hospital	Gen	Church	125	78	10	180	2,513
Parsons, 2,012—Tucker	Gen	Indiv	12	..	5	Estab.	1939
Tucker County Hospital	Gen	Indiv	12	..	5	Estab.	1939
Phillippi, 1,767—Barbour	Gen	Part	35	20	3	39	877
Myers Clinic Hospital	Gen	Part	35	20	3	39	877
Princeton, 6,955—Mercer	Gen	Corp	40	23	6	49	1,019
Mercer Memorial Hospital	Gen	Corp	40	23	6	49	1,019
Princeton Hospital	Gen	Indiv	26	4	4	15	200
Richwood, 5,720—Nicholas	Gen	Indiv	50	9	6	24	323
McClung Hospital	Gen	Indiv	50	9	6	24	323
Sacred Heart Hospital	Gen	Church	34	12	6	40	612
Ronceverte, 2,234—Greenbrier	Gen	Corp	50	39	3	41	1,158
Greenbrier Valley Hosp.	Gen	Corp	50	39	3	41	1,158
Sistersville, 3,072—Tyler	Gen	NPAssn	20	11	6	48	284
Sistersville General Hospital	Gen	NPAssn	20	11	6	48	284
South Charleston, 5,904—Kanawha	Gen	Indiv	35	..	..	New building	..
Dunn Hospital	Gen	Indiv	35	..	..	New building	..
Welch, 5,376—McDowell	Gen	Corp	135	71	6	82	5,389
Grace Hospital	Gen	Corp	100	83	6	101	4,436
Stevens Clinic Hospital	Gen	Corp	100	83	6	101	4,436
Welch Emergency Hospital	Gen	State	115	40	2	47	3,689
Weston, 8,616—Lewis	Gen	Indiv	44	17	4	44	685
General Hospital	Gen	Indiv	44	17	4	44	685
Weston City Hospital	Gen	Corp	20	13	7	33	439
Wheeling, 61,630—Ohio	Gen	NPAssn	251	175	24	823	6,356
Ohio Valley General Hospital	Gen	NPAssn	251	175	24	823	6,356
Wheeling Hospital	Gen	Church	250	91	30	567	3,250
Williamson, 9,410—Mingo	Gen	Corp	100	58	5	113	2,734
Williamson Memorial Hosp.	Gen	Corp	100	58	5	113	2,734

WEST VIRGINIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Berkeley Springs, 1,039—Morgan	Orth	NPAssn	40	23	..	..	47
"The Pines" West Virginia Foundation for Crippled Children	Orth	NPAssn	40	23	..	..	47
Cabin Creek, 840—Kanawha	Gen	Indiv	10	2	2	6	70
Cabin Creek Hospital	Gen	Indiv	10	2	2	6	70
Charleston, 60,403—Kanawha	TbChil	NPAssn	41	35	..	..	38
Hill Crest Sanatorium	TbChil	NPAssn	41	35	..	..	38
Huntington, 75,572—Cabell	Ment	State	952 ¹	926	..	..	391
Huntington State Hospital	Ment	State	952 ¹	926	..	..	391
Moundsville, 14,411—Marshall	TB	County	29	24	..	..	16
Grand View Sanatorium	TB	County	29	24	..	..	16
West Virginia Penitentiary Hospital	Inst	State	86	48	..	..	540
St. Mary's, 2,182—Pleasants	MeDe	State	85 ¹	78	..	..	43
West Virginia Training School	MeDe	State	85 ¹	78	..	..	43
Spencer, 2,493—Roane	Gen	Indiv	20	12	6	48	542
De Pue Hospital	Gen	Indiv	20	12	6	48	542
Spencer State Hospital	Ment	State	947 ¹	908	..	..	330
Weston, 8,646—Lewis	Ment	State	1,709 ¹	1,276	..	..	484
Weston State Hospital	Ment	State	1,709 ¹	1,276	..	..	484
Wheeling, 61,659—Ohio	Mat	NPAssn	20	14	18	15	22
Florence Crittenton Home	Mat	NPAssn	20	14	18	15	22
Ohio County Tuberculosis Sanatorium	TB	County	38	38	..	..	26

WISCONSIN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinsets	Number of Births	Admissions †
Adams, 1,231—Adams	Gen	Corp	10	6	2	21	299
Adams-Friendship Hospital	Gen	Corp	10	6	2	21	299
Algoma, 2,202—Kewaunee	Gen	NPAssn	10	5	4	40	239
Algoma Hospital	Gen	NPAssn	10	5	4	40	239
Amery, 1,354—Polk	Gen	Indiv	15	9	5	37	367
Amery Hospital	Gen	Indiv	15	9	5	37	367
Antigo, 8,610—Langlade	Gen	Church	50	33	10	163	947
Langlade County Memorial Hospital	Gen	Church	50	33	10	163	947
Appleton, 25,267—Outagamie	Gen	Church	170	111	30	743	4,011
St. Elizabeth Hospital	Gen	Church	170	111	30	743	4,011
Arcadia, 1,499—Trempealeau	Gen	Church	18	8	4	38	240
St. Joseph's Hospital	Gen	Church	18	8	4	38	240
Ashland, 10,622—Ashland	Gen	NPAssn	67	33	8	139	893
Ashland General Hospital	Gen	NPAssn	67	33	8	139	893
St. Joseph's Hospital	Gen	Church	135	78	15	232	2,183
Baldwin, 800—St. Croix	Gen	NPAssn	16	7	6	68	389
Baldwin Community Hosp.	Gen	NPAssn	16	7	6	68	389
Baraboo, 5,545—Sauk	Gen	Church	45	30	12	202	1,080
St. Mary's Ringling Hosp.	Gen	Church	45	30	12	202	1,080
Beaver Dam, 9,867—Dodge	Gen	Church	43	25	8	334	763
Lutheran Deaconess Hosp.	Gen	Church	43	25	8	334	763
St. Joseph's Hospital	Gen	Church	60	20	14	112	739
Beloit, 23,611—Rock	Gen	City	80	52	25	456	2,783
Beloit Municipal Hospital	Gen	City	80	52	25	456	2,783
Berlin, 4,106—Green Lake	Gen	NPAssn	25	14	7	85	774
Berlin Memorial Hospital	Gen	NPAssn	25	14	7	85	774
Black River Falls, 1,950—Jackson	Gen	Part	28	23	10	219	755
Krohn Clinic and Hospital	Gen	Part	28	23	10	219	755
Boscobel, 1,762—Grant	Gen	Part	22	7	8	40	250
St. Joseph's Hospital	Gen	Part	22	7	8	40	250
Chippewa Falls, 9,539—Chippewa	Gen	NPAssn	30	18	10	102	815
St. Joseph's Hospital	Gen	NPAssn	30	18	10	102	815
Columbus, 2,514—Columbia	Gen	Church	138	65	12	235	2,162
St. Mary's Hospital	Gen	Church	138	65	12	235	2,162
Cumberland, 1,532—Barron	Gen	Indiv	22	6	4	62	263
Cumberland Hospital	Gen	Indiv	22	6	4	62	263
Darlington, 1,764—Lafayette	Gen	Part	8	5	4	35	210
Drs. Quilan and McDonnell Hospital	Gen	Part	8	5	4	35	210
Dodgeville, 1,937—Iowa	Gen	NPAssn	23	17	5	115	709
Dodgeville General Hospital	Gen	NPAssn	23	17	5	115	709
St. Joseph's Hospital	Gen	Church	60	30	10	119	1,292
Eau Claire, 1,354—Chippewa	Gen	NPAssn	155	96	20	493	3,462
Lutheran Hospital	Gen	NPAssn	155	96	20	493	3,462
Mt. Washington Sanatorium	TB	County	91	90	..	..	97
Sacred Heart Hospital	Gen	Church	153	84	25	414	2,979
Edgerton, 2,906—Rock	Gen	NPAssn	18	10	6	116	501
Edgerton Memorial Hospital	Gen	NPAssn	18	10	6	116	501
Elkhorn, 2,340—Walworth	Gen	County	74	28	11	212	1,125
Walworth County Hospital	Gen	County	74	28	11	212	1,125
Fond du Lac, 26,449—Fond du Lac	Gen	Church	223	191	30	702	5,901
St. Agnes Hospital	Gen	Church	223	191	30	702	5,901
Fort Atkinson, 5,793—Jefferson	Gen	Indiv	12	5	4	52	193
Fort Atkinson General Hosp.	Gen	Indiv	12	5	4	52	193
Frederic, 680—Polk	Gen	Indiv	12	10	4	80	562
Frederic Hospital	Gen	Indiv	12	10	4	80	562
Grantsburg, 777—Burnett	Gen	Corp	21	15	4	77	578
Community Hospital	Gen	Corp	21	15	4	77	578
Green Bay, 37,415—Brown	Gen	Church	79	52	11	276	2,323
Bellin Memorial Hospital	Gen	Church	79	52	11	276	2,323
St. Mary's Hospital	Gen	Church	100	55	22	397	3,422
St. Vincent's Hospital	Gen	Church	220	189	25	667	7,509

WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Hartford, 3,754—Washington							
St. Joseph's Hospital.....	Gen	Church	50	25	8	119	823
Hawthorne, 75—Douglas							
Middle River Sanatorium.....	TB	County	140	130	..	..	91
Hayward, 1,207—Sawyer							
Hayward Indian Hospital..	Gen	IA	55	41	5	106	727
Hillsboro, 972—Vernon							
Hansberry Hospital	Gen	Indiv	25	13	5	46	416
Iola, 763—Waupaca							
Iola Hospital	Gen	Corp	18	10	6	22	176
Janesville, 21,628—Rock							
Mercy Hospital.....	Gen	Church	122	77	22	403	2,240
Pinehurst Sanatorium.....	TB	County	68	63	..	..	89
Jefferson, 2,639—Jefferson							
Forest Lawn Sanatorium....	TB	County	58	51	..	..	55
Kaukauna, 6,581—Outagamie							
Riverview Sanatorium.....	TB	County	65	56	..	..	55
Kenosha, 50,262—Kenosha							
Kenosha Hospital.....	Gen	NPAasn	150	57	30	277	2,081
St. Catherine's Hospital							
and Sanitarium.....	Gen	Church	50	32	15	400	1,212
Willowbrook Sanatorium.....	TB	County	49	50	..	..	56
Keshena, 500—Shawano							
St. Joseph's Indian Hospital	Gen	Church	65	33	7	105	888
La Crosse, 39,614—La Crosse							
Grandview Hospital.....	Gen	NPAasn	106	42	10	105	1,290
La Crosse Hospital	Gen	NPAasn	40	25	12	123	1,375
La Crosse Lutheran Hosp.	Gen	Church	135	70	9	126	2,591
St. Francis Hospital.....	Gen	Church	280	170	30	703	5,500
Ladysmith, 3,493—Rusk							
St. Mary's Hospital.....	Gen	Church	35	24	6	149	823
Lancaster, 2,432—Grant							
Doolittle-Glynn Hospital....	Gen	Indiv	12	4	5	44	250
Lancaster General Hospital..	Gen	Part	12	5	6	17	160
Laona, 1,500—Forest							
Ovitz Hospital	Gen	Indiv	15	7	6	52	311
Madison, 57,899—Dane							
Lake View Sanatorium.....	TB	County	146	142	..	..	112
Madison General Hospital.....	Gen	NPAasn	160	131	25	569	5,352
Methodist Hospital.....	Gen	Church	110	53	10	99	2,351
Morningside Sanatorium	TB	NPAasn	55	42	..	..	65
Normandale	N&M	Corp	34	17	..	..	202
St. Mary's Hospital.....	Gen	Church	175	123	40	976	5,731
State of Wisconsin General Hospital.....	Gen	State	650	635	22	201	12,263
Wisconsin Orthopedic Hospital for Children.....	Unit of State of Wisconsin General Hosp.						
Wisconsin Psychiatric Inst.	Unit of State of Wisconsin General Hosp.						
Manitowoc, 22,963—Manitowoc							
Holy Family Hospital.....	Gen	Church	125	76	20	423	2,496
Marinette, 13,734—Marinette							
Marinette and Menominee Hospital	Gen	NPAasn	50	26	10	246	1,354
Marshfield, 8,778—Wood							
St. Joseph's Hospital.....	Gen	Church	157	130	18	375	3,667
Mauston, 2,107—Juneau							
Mauston Hospital	Gen	Corp	45	21	6	109	792
Medford, 1,918—Taylor							
Medford Clinic	Gen	Corp	39	20	6	85	926
Mendota, 400—Dane							
Mendota State Hospital....	Ment	State	860†	776	..	..	1,345
Veterans Admin. Facility.....	Ment	Vet	295	295	..	..	53
Menomonie, 5,595—Dunn							
Menomonie City Hospital..	Gen	City	25	20	7	89	601
Merrill, 8,458—Lincoln							
Holy Cross Hospital.....	Gen	Church	50	31	11	239	1,210
Lincoln County Hospital....	Gen	County	27	25	4	40	318
.....	Gen	NPAasn	150	85	25	517	3,290
.....	Gen	Church	125	88	28	771	4,169
Johnston Emergency Hosp.	Emerg	City	25	14	4	5	4,042
Milwaukee Children's Hospital.....	Chil	NPAasn	220	111	..	..	4,182
Milwaukee County Hospital, Dispensary-Emergency Unit	Unit of Milwaukee County Hospital, Wauwatosa						
Milwaukee Hospital.....	Gen	Church	224	175	41	841	6,850
Misericordia Hospital.....	Gen	Church	110	67	40	559	3,212
Mt. Sinai Hospital.....	Gen	NPAasn	100	116	30	835	6,119
Sacred Heart Sanitarium.....	Gen	Church	300	169	..	..	2,045
St. Anthony Hospital	Gen	Church	43	33	16	467	1,510
St. Joseph's Hospital.....	Gen	Church	325	185	72	1,501	8,159
St. Joseph's Hospital Annex..	Unit of St. Joseph's Hospital						
St. Luke's Hospital.....	Gen	Church	100	72	20	714	3,625
St. Mary's Hill	N&M	Church	194	65	..	..	432
St. Mary's Hospital.....	Gen	Church	170	117	50	466	6,352
Shorewood Hospital-Sanit.	N&M	Corp	59	31	..	..	249
South View Hospital.....	Isd	City	250	85	..	..	1,318
Stark Hospital.....	Unit of Milwaukee Children's Hospital						
Veterans Admin. Facility.....	GenTb	Vet	1,192	987	..	..	5,805
West Side Hospital.....	Gen	NPAasn	25	11	8	51	759
Monroe, 5,015—Green							
Evangelical Deaconess Hosp. Gen	Church	Church	42	33	15	231	1,250
St. Clare Hospital.....	Gen	Church	60	..	13	Estab. 1929	
Mt. Horeb, 1,425—Dane							
Buckner Hospital	Gen	Indiv	10	2	4	22	192
Neenah, 9,151—Winnebago							
Theda Clark Memorial Hospital.....	Gen	NPAasn	55	59	17	224	1,455

WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
New London, 4,661—Waupaca							
Community Hospital	Gen	Church	50	26	12	17	74
Memorial Hospital	Gen	NPAasn	13	4	6	25	17
Oconomowoc, 4,190—Waukesha							
Rogers Memorial Sanitarium N&M	NPAasn	Corp	54	42	..	..	8
Summit Hospital	Gen	Corp	35	26	4	50	8
Oconto Falls, 1,921—Oconto							
Oconto Falls Hospital	Gen	City	11	5	3	53	25
Onalaska, 1,408—La Crosse							
Oak Forest Sanatorium.....	TB	County	65	66	..	..	5
Osceola, 607—Polk							
Ladd Memorial Hospital.....	Gen	Part	11	6	3	2	21
Oshkosh, 40,108—Winnebago							
Mercy Hospital.....	Gen	Church	185	116	34	204	2,581
Park Falls, 3,036—Price							
Park Falls Hospital.....	Gen	Indiv	25	12	4	09	54
Pewaukee, 1,067—Waukesha							
Oak Sanatorium	TB	Counties	42	39	..	..	23
Platteville, 4,047—Grant							
Andrew Hospital	Gen	Indiv	20	7	4	13	15
Wilson Cunningham Hosp.	Gen	Part	20	10	8	31	24
Plum City, 320—Pierce							
Plum City Hospital.....	Gen	Indiv	17	9	5	65	20
Plymouth, 3,882—Sheboygan							
Plymouth Hospital	Gen	Church	36	17	8	125	57
Rocky Knoll Sanatorium.....	TB	County	90	89	..	..	5
Portage, 6,308—Columbia							
St. Saviour's General Hosp.	Gen	Church	63	39	16	235	1,221
Prairie du Chien, 3,943—Crawford							
Beaumont Hospital	Gen	Indiv	25	10	8	121	65
Prairie du Chien Sanitarium-Hospital	Gen	Corp	50	27	8	87	1,155
Prescott, 755—Pierce							
St. Croixdale Sanitarium..	GenN&M	Corp	50	30	4	8	111
Pureair (Bayfield P.O.), —Bayfield							
Pureair Sanatorium	TB	Counties	68	64	..	..	8
Racine, 67,542—Racine							
St. Luke's Hospital.....	Gen	Church	120	66	23	268	2,221
St. Mary's Hospital.....	Gen	Church	180	95	33	690	4,000
Sunny Rest Sanatorium.....	TB	County	80	53	..	..	0
Reedsburg, 2,667—Sauk							
Reedsburg Municipal Hosp.	Gen	City	30	15	8	102	61
Rhineland, 8,019—Oneida							
St. Mary's Hospital.....	Gen	Church	75	39	10	201	1,101
Rice Lake, 5,177—Barron							
Lakeside Methodist Hosp.	Gen	Church	50	32	8	132	1,891
St. Joseph Hospital.....	Gen	Church	42	23	6	80	1,251
Richland Center, 3,632—Richland							
Richland Hospital	Gen	NPAasn	61	40	12	115	1,041
Ripon, 3,984—Fond du Lac							
Ripon Municipal Hospital....	Gen	City	18	12	6	93	52
River Falls, 2,363—Pierce							
City Hospital	Gen	City	27	9	8	82	47
St. Croix Falls, 952—Polk							
St. Croix Falls Hospital.....	Gen	Indiv	20	9	4	51	57
Shawano, 4,188—Shawano							
Shawano Municipal Hospital	Gen	CyCo	55	36	10	241	1,212
Sheboygan, 39,251—Sheboygan							
St. Nicholas Hospital.....	Gen	Church	131	118	18	593	3,702
Sheboygan Memorial Hospital.....	Gen	NPAasn	86	60	18	234	1,212
Shullsburg, 1,014—Lafayette							
Dr. Ennis' Hospital.....	Gen	Indiv	15	6	2	12	13
South Milwaukee, 10,760—Milwaukee							
South Milwaukee Hospital..	Gen	Indiv	13	5	4	20	21
Sparta, 4,949—Monroe							
St. Mary's Hospital.....	Gen	Church	60	43	10	224	1,212
Stanley, 1,988—Chippewa							
Victory Hospital	Gen	NPAasn	20	11	4	63	73
Statesan, 121—Waukesha							
Wisconsin State Sanat.	TB	State	210	207	..	..	11
Stevens Point, 13,623—Portage							
River Pines Sanatorium.....	TB	Church	62	61	..	..	12
St. Michael's Hospital.....	Gen	Church	75	60	15	121	1,151
Stoughton, 4,497—Dane							
Stoughton Community Hosp. Gen	Gen	NPAasn	24	10	9	147	57
Sturgeon Bay, 4,983—Door							
Egeland Memorial Hospital. Gen	Indiv	Indiv	25	9	5	83	63
Leasum Hospital	Gen	Indiv	15	9	2	33	43
.....	Gen	Church	50	47	10	141	87
.....	Gen	Church	38	22	14	201	73
.....	Gen	Church	170	73	30	294	1,851
Tomah, 3,941—Monroe							
Tomah Indian Hospital.....	Gen	IA	44	30	5	61	51
Tomahawk, 2,919—Lincoln							
Sacred Heart Hospital.....	Gen	Church	60	20	10	63	63
Two Rivers, 10,083—Manitowoc							
Two Rivers Municipal Hosp. Gen	Gen	City	40	27	10	151	1,212
Washburn, 2,223—Bayfield							
Washburn Hospital	Gen	NPAasn	14	5	5	21	7
Watertown, 10,613—Jefferson							
St. Mary's Hospital	Gen	Church	75	45	17	257	1,401
Waukesha, 17,176—Waukesha							
Waukesha Memorial Hosp.	Gen	City	85	63	21	429	2,251
Waukesha Springs Sanit.	N&M	Corp	50	..	..	..	21
Waupaca, 3,131—Waupaca							
City Hospital	Gen	Part	14	8	2	13	21
Waupun, 5,708—Fond du Lac							
Central State Hospital for Insane	Ment	State	225†	224	..	..	15

Key to symbols and abbreviations is on page 1195

WISCONSIN—Continued

REGISTERED HOSPITALS

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WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Ausau, 23,738—Marathon	Gen	County	66	66	..	..	57
Mount View Sanatorium	TB	County	120	77	20	405	2,894
St. Mary's Hospital	Gen	Church	95	69	20	360	2,607
Ausau Memorial Hospital	Gen	NPAssn	..	..	..	..	..
Wauwatosa, 21,194—Milwaukee	Gen	County	1,070	1,651	..	..	220
Blue Mound Preventorium	Unit of Muirdale Sanatorium	County	1,030	566	75	1,495	20,179
Chronic Insane Asylum for Milwaukee County	Ment	County	1,083	1,040	..	..	500
Milwaukee County Hospital	Gen	County	148	129	..	..	306
Milwaukee County Hospital for Mental Diseases	Gen	County	500	460	..	..	619
Milwaukee Sanatorium	Ment	County	27	18	8	109	705
Muirdale Sanatorium	N&M	County	110	98	..	..	130
West Bend, 4,760—Washington	TB	County	27	14	3	74	641
St. Joseph's Hospital	Gen	Church	50	40	..	..	115
West DePere, —Brown	Gen	County	98	95	..	..	94
Hickory Grove Sanatorium	TB	County	83	87	..	..	949
Whitehall, 915—Trempealeau	Gen	County	35	31	12	314	1,331
Whitehall Community Hosp.	Gen	County	260	225	..	..	80
Winnetka, 269—Manitowoc	Gen	County	16	6	4	24	184
Maple Crest Sanatorium	TB	NPAssn	27	14	3	74	641
Winnebago, 150—Winnebago	TB	County	50	40	..	..	115
Sunny View Sanatorium	TB	County	98	95	..	..	94
Winnebago State Hospital	TB	County	83	87	..	..	949
Wisconsin Rapids, 8,720—Wood	Ment	County	35	31	12	314	1,331
Review Hospital	Gen	NPAssn	..	..	..	..	..
Related Institutions							
Appleton, 25,267—Outagamie	Gen	County	260	225	..	..	80
Outagamie County Asylum for Chronic Insane	Ment	County	16	6	4	24	184
Barron, 1,863—Barron	Gen	County	355	326	..	..	98
Barron City Hospital	Gen	County	12	5	6	49	187
Chippewa Falls, 8,539—Chippewa	Gen	County	174	153	..	..	32
Chippewa County Chronic Insane Asylum	Ment	County	232	234	..	..	22
Northern Wisconsin Colony and Training School	McDe	State	253	224	..	..	97
Clintonville, 3,572—Waupaca	Gen	County	296	290	..	..	20
Dodgeville, 1,937—Iowa	Gen	County	284	289	..	..	63
Iowa County Insane Asylum	Ment	County	10	3	..	..	263
Eau Claire, 26,287—Eau Claire	Gen	County	5	2	3	18	82
Eau Claire County Insane Asylum	Ment	County	404	397	..	..	86
Elkhorn, 2,340—Walworth	Gen	County	330	320	..	..	97
Walworth County Asylum for the Insane	Ment	County	210	200	..	..	44
Fond du Lac, 26,449—Fond du Lac	Gen	County	275	265	..	..	55
Fond du Lac County Insane Asylum	Ment	County	10	2	2	15	88
Green Bay, 37,415—Brown	Gen	County	250	250	..	..	56
Brown County Insane Asylum	Ment	County	64	5	..	..	20
Wisconsin State Reformatory Hospital	Inst	State	224	207	..	..	34
Hazel Green, 601—Grant	Gen	County	241	231	..	..	35
Fillbach Hospital	Gen	County	186	180	..	..	..
Atasca, 315—Douglas	Gen	County	36	36	..	..	..
Douglas County Asylum, Home and Sanatorium	Ment	County	225	201	..	..	..
Parkland Sanatorium	Unit of Douglas County Asylum, Home and Sanatorium	County	174	174	..	..	..
Janesville, 21,628—Rock	Gen	County	40	16	6	58	618
Rock County Hospital	Gen	County	..	..	..	..	..
Jefferson, 2,629—Jefferson	Gen	County	..	..	..	..	..
Jefferson County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Juneau, 1,154—Dodge	Gen	County	..	..	..	..	..
Dodge County Insane Asylum and Poor House	Ment	County	..	..	..	..	..
Kewaunee, 2,409—Kewaunee	Gen	County	..	..	..	..	..
Dana and Dockery Hospital	Gen	County	..	..	..	..	..
Lake Tomahawk, 60—Oneida	Gen	County	..	..	..	..	..
Lake Tomahawk State Camp	TB	County	..	..	..	..	..
Lancaster, 2,452—Grant	Gen	County	..	..	..	..	..
Grant County Asylum	Ment	County	..	..	..	..	..
Madison, 37,899—Dane	Gen	County	..	..	..	..	..
East Washington Avenue Hospital	Gen	County	..	..	..	..	..
Manitowoc, 22,962—Manitowoc	Gen	County	..	..	..	..	..
Manitowoc County Insane Asylum	Ment	County	..	..	..	..	..
Marshfield, 8,775—Wood	Gen	County	..	..	..	..	..
Wood County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Menomonie, 5,365—Dunn	Gen	County	..	..	..	..	..
Dunn County Asylum	Ment	County	..	..	..	..	..
Milwaukee, 578,249—Milwaukee	Gen	County	..	..	..	..	..
Layton Home	Gen	County	..	..	..	..	..
Monroe, 3,015—Green	Gen	County	..	..	..	..	..
Green County Asylum	Ment	County	..	..	..	..	..
Nellville, 2,115—Clark	Gen	County	..	..	..	..	..
Nellville Hospital	Gen	County	..	..	..	..	..
New Richmond, 2,112—St. Croix	Gen	County	..	..	..	..	..
St. Croix County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Oconto, 5,620—Oconto	Gen	County	..	..	..	..	..
Oconto County and City Hospital	Gen	NPAssn	..	..	..	..	..

Key to symbols and abbreviations is on page 1195

Related Institutions

Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Oshkosh, 40,108—Winnebago	Gen	County	84	75	..	..	50
Alexian Brothers Hospital	N&M	Church	338	348	..	..	50
Owen, 1,102—Clark	Gen	County	8	6	2	2	..
Clark County Hospital	Gen	County	260	220	..	..	55
Oxford, 397—Marquette	Gen	County	54	16	..	..	235
Oxford Hospital	Gen	County	52	48	..	..	68
Peshigo, 1,579—Marquette	Gen	County	206	180	..	..	74
Marinette County Insane Asylum	Ment	County	154	144	..	..	34
Racine, 67,542—Racine	Gen	County	190	186	..	..	35
Lincoln Memorial Hospital for Communicable Diseases	TbIso	City	175	167	..	..	16
Racine County Asylum	Gen	County	760	748	..	..	87
Racine County Hospital	Gen	County	400	394	..	..	..
Reedsburg, 2,967—Sauk	Gen	County	151	130	..	..	45
Sauk County Asylum	Ment	County	21	13	7	80	641
Richland Center, 3,632—Richland	Gen	County	..	..	..	..	..
Richland County Asylum for Insane	Ment	County	..	..	..	..	..
Shawano, 4,188—Shawano	Gen	County	..	..	..	..	..
Shawano County Insane Asylum	Ment	County	..	..	..	..	..
Sheboygan, 39,251—Sheboygan	Gen	County	..	..	..	..	..
Sheboygan County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Spartan, 4,949—Monroe	Gen	County	..	..	..	..	..
Monroe County Insane Asylum	Ment	County	..	..	..	..	..
Union Grove, 755—Racine	Gen	County	..	..	..	..	..
Southern Wisconsin Colony and Training School	McDe	State	..	..	..	..	..
Verona, 455—Dane	Gen	County	..	..	..	..	..
Dane County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Viroqua, 2,972—Vernon	Gen	County	..	..	..	..	..
Vernon County Asylum	Ment	County	..	..	..	..	..
Viroqua Hospital	Gen	County	..	..	..	..	..
Watertown, 10,613—Jefferson	Gen	County	..	..	..	..	..
Bethesda Lutheran Home for Feeble-minded and Epileptics	McDe	Church	..	..	..	..	..
Waukesha, 17,176—Waukesha	Gen	County	..	..	..	..	..
Waukesha County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Waupaca, 3,131—Waupaca	Gen	County	..	..	..	..	..
Waupaca Hosp. and Clinic	Gen	County	..	..	..	..	..
Waupun, 5,768—Fond du Lac	Gen	County	..	..	..	..	..
Clark and Swartz Hospital	Gen	County	..	..	..	..	..
Wisconsin State Prison Hosp. Inst	Part	State	..	..	..	..	..
Wausau, 23,738—Marathon	Gen	County	..	..	..	..	..
Dr. Lee M. Willard Memorial Preventorium	TB	County	..	..	..	..	..
Marathon County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
Marathon County Home and Hospital	Inst	County	..	..	..	..	..
Wauwatosa, 21,194—Milwaukee	Gen	County	..	..	..	..	..
Milwaukee County Home for Dependent Children	Inst	County	..	..	..	..	..
St. Camillus Hospital	Inst	County	..	..	..	..	..
Salvation Army Martha Washington Women's Home and Hospital	Mat	Church	..	..	..	..	..
West Bend, 4,760—Washington	Gen	County	..	..	..	..	..
Washington County Asylum for Chronic Insane	Ment	County	..	..	..	..	..
West Salem, 1,011—La Crosse	Gen	County	..	..	..	..	..
La Crosse County Asylum for Insane	Ment	County	..	..	..	..	..
Weyauwega, 1,067—Waupaca	Gen	County	..	..	..	..	..
Waupaca County Insane Asylum	Ment	County	..	..	..	..	..
Whitehall, 915—Trempealeau	Gen	County	..	..	..	..	..
Trempealeau County Asylum	Ment	County	..	..	..	..	..
Winnebago, 150—Winnebago	Gen	County	..	..	..	..	..
Winnebago County Asylum	Ment	County	..	..	..	..	..
Wyocena, 490—Columbia	Gen	County	..	..	..	..	..
Columbia County Asylum	Ment	County	..	..	..	..	..

WYOMING

Hospitals and Sanatoriums

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basinets	Number of Births	Admissions †
Basin, 904—Big Horn	Gen	State	33	26	..	..	42
Wyoming Tuberculosis Sanatorium	TB	State	10	5	2	22	85
Burns, 216—Laramie	Gen	County	60	55	10	325	1,931
Burns Private Hospital	Gen	County	100	65	16	263	2,871
Casper, 16,619—Natrona	Gen	County	107	109	..	..	767
Memorial Hospital of Natrona County	Gen	County	19	10	4	32	375
Cheyenne, 17,361—Laramie	Gen	County	..	..	..	..	..
Memorial Hospital of Laramie County	Gen	County	..	..	..	..	..
Veterans Admin. Facility	Gen	County	..	..	..	..	..
Douglas, 1,917—Converse	Gen	County	..	..	..	..	..
Douglas Hospital	Gen	County	..	..	..	..	..

WYOMING—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Evanston, 3,075—Uinta							
Wyoming State Hospital [▲] .. Ment	State		635 ¹	587	..	...	132
Fort Warren, 22—Laramie							
Station Hospital [▲] Gen	Army		280	170	6	56	4,568
Fort Washakie, 150—Fremont							
Wind River Indian Hospital Gen	IA		43	26	6	68	634
Gillette, 1,340—Campbell							
McHenry Hospital..... Gen	Indiv		15	8	6	23	270
Jackson, 533—Teton							
St. John's Hospital..... Gen	Church		25	9	4	52	412
Kennerly, 1,884—Lincoln							
Lincoln County Miner's Hospital..... Gen	NPAasn		25	3	5	68	371
Lander, 1,826—Fremont							
Bishop Randall Hospital.... Gen	Church		20	13	6	72	574
Laramie, 8,609—Albany							
Iverson Memorial Hospital. Gen	County		72	36	15	255	1,602
Lovell, 1,857—Big Horn							
Lovell Hospital..... Gen	Part		20	9	6	104	313
Powell, 1,156—Park							
Whitlock Hospital..... Gen	Corp		30	4	5	50	308
Rock Springs, 8,440—Sweetwater							
Wyoming General Hospital. Gen	State		100	59	12	362	2,610
Sheridan, 8,536—Sheridan							
Sheridan County Memorial Hospital..... Gen	County		70	41	12	349	1,560
Veterans Admin. Facility [▲] .. Ment	Vet		598	365	..	...	232
Wheatland, 1,997—Platte							
Wheatland General Hosp. [▲] Gen	NPAasn		41	20	7	106	912
World, 1,461—Washakie							
World Hospital..... Gen	Corp		20	...	8	Estab.	1930

Related Institutions

Basin, 903—Big Horn							
Basin Hospital..... Gen	Indiv		10	4	4	23	107
Evanston, 3,075—Uinta							
Jacoby Hospital..... Gen	Indiv		10	...	No data supplied		
Greybull, 1,806—Big Horn							
St. Luke's Hospital..... Gen	Indiv		10	6	6	37	206
Hanna, 1,500—Carbon							
Hanna Hospital..... Gen	NPAasn		12	7	3	28	250
Lander, 1,826—Fremont							
Wyoming State Training School..... MeDe	State		375 ¹	347	..	...	103
Sheridan, 8,536—Sheridan							
Reynolds Home..... Gen	Indiv		9	3	6	70	158
Thermopolis, 2,129—Hot Springs							
General Hospital..... Gen	Part		40	10	10	96	652
Yellowstone Park, 200—Yellowstone National Park							
Yellowstone Park Hospital. Gen	Indiv		33	17	3	5	276

ALASKA

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Anchorage, 2,277							
Alaska Railroad Base Hosp. Gen	Fed		30	12	5	67	1,516
Bethel, 278							
Indian Service Hospital.... Gen	IA		40	...	6	Estab.	1940
Cordova, 980							
Cordova General Hospital.. Gen	Indiv		12	8	3	21	225
Fairbanks, 2,101							
St. Joseph's Hospital..... Gen	Church		50	40	6	86	827
Fort Yukon, 304							
Hudson Stuck Memorial Hospital [▲] Gen	Church		38	26	2	21	156
Haines, 344							
Station Hospital..... Gen	Army		15	7	2	7	289
Juneau, 4,043							
St. Ann's Hospital..... Gen	Church		64	52	9	98	864
U. S. Hospital for Natives.. GenTb	IA		69	46	8	41	322
Kanakanak, 177							
Kanakanak Native Hospital Gen	IA		18	21	2	29	302
Ketchikan, 3,796							
Ketchikan General Hospital. Gen	Church		50	31	8	86	662
Kotzebue, 291							
Kotzebue Hospital..... Gen	IA		16	13	1	3	188
Mountain Village, 76							
U. S. Hospital for Natives (Mountain Village Hosp.).. Gen	IA		21	14	2	21	163
Nome, 1,213							
Maynard-Columbus Hospital Gen	Church		20	...	2	...	...
Palmer							
Matanuska Valley Hospital. Gen	Corp		26	14	4	46	303
Petersburg, 1,252							
Petersburg General Hospital Gen	City		10	6	3	28	244
Seward, 825							
Seward General Hospital... Gen	Church		25	10	3	26	449
Sitka, 1,655							
Pioneers' Home Hospital... Inst	Ter		45	45	..	...	169
Skagway, 492							
White Pass Hospital..... Gen	NPAasn		10	3	2	14	912
Tanana, 185							
Tanana Hospital..... Gen	IA		27	22	3	17	241
Wrangell, 948							
Bishop Rowe General Hosp. Gen	Church		14	4	3	25	142

CANAL ZONE

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Ancon, 1,140							
Gorgas Hospital [▲] Gen	Fed		855	435	25	671	1,140
Balboa, 2,902							
Palo Seco Leper Colony.... Lepro	Fed		122	120	..	...	...
Station Hospital..... Gen	Army		35	29	..	...	...
Corozal, 1,780							
Corozal Hospital..... Ment	Fed		340	288	..	...	...
Station Hospital..... Gen	Army		52	52	..	...	...
Cristobal, 599							
Colon Hospital..... Gen	Fed		114	84	15	24	1,140
Fort Davis, 293							
Station Hospital..... Gen	Army		50	38	..	...	...
Fort Randolph (Coco Solo P.O.), 724							
Station Hospital..... Gen	Army		9	9	..	...	...
Fort Sherman, 786							
Station Hospital..... Gen	Army		54	33	..	...	...

GUAM

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Agana							
Susana Hospital for Natives. Unit of U. S. Naval Hospital	U. S. Navy		156	82	10	94	1,140
U. S. Naval Hospital..... Gen							

HAWAII

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Aiea, 3,021—Honolulu							
Honolulu Plantation Hosp. Gen	NPAasn		46	...	4	...	...
Eleele, 312—Kauai							
McBryde Sugar Company Hospital..... Gen	NPAasn		30	16	5	4	69
Ewa, 4,739—Honolulu							
Ewa Plantation Company Hospital..... Gen	NPAasn		45	22	6	74	50
Haina, —Hawaii							
Honokaa Sugar Company Hospital..... Gen	NPAasn		28	11	4	20	24
Hakalau, 527—Hawaii							
Hakalau Plantation Hosp... Gen	NPAasn		28	12	3	31	43
Hana, 293—Maui							
Hana Hospital..... Gen	County		29	...	4	...	...
Hilo, 19,468—Hawaii							
Hilo Memorial Hospital [▲] Gen	County		143	91	15	247	2,140
Puunahua Home, County of Hawaii Tuberculosis Hosp. TB	County		165	141	..	...	...
Honolulu, 137,582—Honolulu							
Japanese Hospital..... Gen	NPAasn		120	...	5	...	...
Kapiolani Maternity and Gynecological Hospital... GynMat	NPAasn		51	33	20	1,057	1,140
Kauaikeolani Children's Hosp. Chl	NPAasn		75	60	..	...	...
Leahi Home [▲] TB	NPAasn		445	427	..	...	...
Queen's Hospital [▲] Gen	NPAasn		300	235	20	1,140	1,140
St. Francis Hospital [○] Gen	Church		65	50	10	304	1,140
Shriners Hospital for Crippled Children [▲] Orth	Frat		28	23	..	...	...
Tripler General Hospital... Gen	Army		373	215	10	108	1,140
Hooluhua, —Maui							
Robert W. Shingle, Jr., Memorial Hospital..... Gen	Church		19	12	5	66	340
Kahuku, 1,503—Honolulu							
Kahuku Plantation Company's Hospital [▲] Gen	NPAasn		29	19	6	115	...
Kalaupapa, —Kalaupapa							
Kalaupapa Settlement..... Lepro	Ter		400	370	2	2	...
Kaneohe (Heela P.O.), 112—Honolulu							
Territorial Hospital..... Ment	Ter		400	866	..	...	...
Kealahou, 350—Hawaii							
Kona County Hospital.... Gen	County		28	21	3	50	24
Keala, 100—Kauai							
Samuel Mahelona Memorial Hospital..... TB	County		120	106	..	...	...
Kilauea, 1,232—Kauai							
Kilauea Hospital..... Gen	NPAasn		25	...	4	...	...
Kohala, 720—Hawaii							
Kohala County Hospital... Gen	County		50	19	6	145	...
Koloa, 1,844—Kauai							
Koloa Sugar Company's Hospital..... Gen	NPAasn		22	10	2	35	140
Kula (Wailakoa P.O.), 25—Maui							
Kula Sanatorium..... TB	StaCounty		195	172	..	...	...
Lahaina, 2,720—Maui							
Pioneer Mill Company's Hospital..... Gen	NPAasn		63	43	9	174	1,140
Lanai City, —Maui							
Lanai Hospital..... Gen	NPAasn		27	...	4	...	...
Lihue, 2,770—Kauai							
G. N. Wilcox Memorial Hospital [▲] Gen	NPAasn		94	72	11	141	1,140

Key to symbols and abbreviations is on page 1195

REGISTERED HOSPITALS

1257

HAWAII—Continued

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Makaweli, 974—Kauai Hawaiian Sugar Company's Hospital	Gen	NPAssn	43	16	4	88	920
Olaa, 597—Hawaii Olaa Hospital	Gen	NPAssn	44	34	2	56	934
Ookala, 326—Hawaii Hospital of Kaiwika Sugar Company	Gen	NPAssn	10	4	4	28	141
Panauhau, 536—Hawaii Panauhau Sugar Company Hospital	Gen	NPAssn	18	5	2	19	215
Panulo, 1,233—Hawaii Panulo Hospital	Gen	NPAssn	12	5	2	22	214
Pahala, 290—Hawaii Hawaiian Agricultural Company Hospital	Gen	NPAssn	30	18	6	100	613
Paia, 4,171—Maui Maui Agricultural Company's Hospital	Gen	NPAssn	102	48	10	200	2,448
Papaaloo, 73—Hawaii Laupahochoe Hospital	Gen	NPAssn	23	6	4	23	284
Pearl City, 1,071—Honolulu Waimano Home for Feeble-minded Persons	McDe Ter		368	368			28
Pearl Harbor, 200—Honolulu U. S. Naval Hospital	Gen	Navy	263	141			3,573
Pepeekeo, 520—Hawaii Pepeekeo Central Hospital	Gen	NPAssn	41	24	4	132	757
Puunene, 4,080—Maui Schofield Barracks (Honolulu P.O.), 4,250—Honolulu Station Hospital	Gen	Army	429	60	24	281	2,080
Wainalu, 4,511—Honolulu Wainalu Agricultural Company Ltd. Hospital	Gen	NPAssn	40	22	6	168	788
Wailuku, 6,998—Maui Wailuku Hospital	Gen	County Indiv	86	78	10	234	2,010
Waimanalo, 2,091—Kauai Waimanalo Hospital	Gen	NPAssn	36	35	6	110	1,132
Waiolu, 5,874—Honolulu Onuh Sugar Company Ltd Hospital	Gen	NPAssn	65	50	10	55	1,459
Tamara Hospital	Gen	Indiv	7	4	3	45	173

PHILIPPINE ISLANDS

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Bacolod, 19,350—Occidental Negros Occidental Hospital	Gen	Gov't	100	...	6	...	...
Children's Maternity and Provincial Hospital	Match	Gov't	62	44	18	494	2,016
Baguio, 5,464—Benguet Baguio Hospital	Gen	Gov't	92	...	8	...	...
Lourdes Hospital	Gen	Church	100	30	12	91	930
Station Hospital	Gen	Gov't	27	27	3	32	882
Batangas, 41,182—Batangas Batangas Provincial Hosp.	Gen	Gov't	27	23	1	12	853
Bayombong, 5,385—Nueva Vizcaya Bayombong Hospital	Gen	Gov't	15	...	2	...	...
Binalbagan, 8,802—Occidental Negros Rizal Memorial Hospital	Gen	NPAssn	80	36	...	47	1,458
Bontoc, 600—Mountain Bontoc Hospital	Gen	Gov't	24	26	...	38	1,870
Bataan, 9,790—Agusan Bataan Public Hospital	Gen	Gov't	75	84	6	90	3,315
Cubantuan, 15,282—Nueva Ecija Nueva Ecija Provincial Hospital	Gen	Gov't	50	...	5	...	...
Cagayan, 28,161—Misamis Oriental Cagayan Mission Hospital	Gen	Church	25	...	4	...	...
Misamis Oriental Provincial Hospital	Gen	NPAssn	39	...	...	...	...
Calamba, 18,082—Laguna Calamba Sugar Estate Hosp.	Gen	Gov't	30	27	4	20	1,010
Calvo, 11,855—Capiz Capiz Provincial Hospital	Gen	Gov't	400	375	...	...	806
Calocan, 19,531—Rizal Quezon Institute	TB	NPAssn	80	60	5	58	2,411
Capiz, 21,956—Capiz Emmanuel Hospital	Gen	Church	125	132	3	88	1,368
Cavite, 22,163—Cavite Cavite Hospital	Gen	Part Navy	22	12	2	14	527
U. S. Naval Hospital	Gen	Part Navy	33	24	26	1,216	1,319
Cebu, 63,300—Cebu Cebu General Hospital	Gen	Part Navy	20	...	...	...	...
Cebu Maternity Clinic	Gen	Part Navy	24	...	...	...	...
Cebu General House	Gen	Part Navy	20	...	...	...	...
Cebu Medico-Surgical	Gen	Part Navy	20	...	...	...	...
Chong Hoa Chinese Hosp.	Gen	Part Navy	20	...	...	...	...
St. Joseph's Hospital	Gen	Part Navy	20	...	...	...	...
Southern Islands Hospital	Gen	Part Navy	20	...	...	...	...
Cervantes, 2,533—Iloilo Sur Cervantes Hospital	Gen	Part Navy	20	...	...	...	...

PHILIPPINE ISLANDS—Continued

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Corregidor, —Cavite Station Hospital	Gen	Army	150	...	4	...	...
Cotabato, 410—Cotabato Cotabato Public Hospital	Gen	Gov't	40	...	2	...	...
Culion, —Palawan Culion Lepre Colony Hospital	Gen	Gov't	618	...	16	...	...
Emergency Hospital No. 1, —Palawan Cuyo Public Hospital	Gen	Gov't	20	...	3	...	...
Dagupan, 22,612—Pangasinan Pangasinan Provincial Hosp.	Gen	Gov't	75	87	5	98	3,473
Dahican, —Camarines Norte Dahican Hospital	Gen	NPAssn	30	18	1	16	632
Dansalan, 5,988—Lanao Lanao Public Hospital	Gen	Gov't	50	...	...	...	...
Dapitan, 12,865—Zamboanga Rizal Memorial Hospital	Gen	Gov't	30	...	...	...	...
Davao, 13,046—Davao Davao Mission Hospital	Gen	Church	40	...	1	...	...
Davao Oriental Hospital	Gen	Church	35	...	5	...	...
Davao Public Hospital	Gen	Gov't	60	57	6	46	2,814
Dumaguete, 16,227—Oriental Negros Dumaguete Mission Hospital	Gen	NPAssn	37	26	3	40	1,311
Fabrica, —Occidental Negros Iloilo Hospital	Gen	Church	65	47	2	45	1,242
Fort Stotsenburg, —Pampanga Station Hospital	Gen	Corp	50	46	...	58	1,519
Iloilo, 49,114—Iloilo Iloilo Maternity and Child Hospital	Gen	Army	112	44	4	314	2,330
Iloilo Mission Hospital	Match	Indiv	11	...	4	...	...
Iloilo Polyclinic and Hosp.	Gen	Church	91	67	12	128	2,229
St. Paul's Mission Hospital	Gen	Indiv	25	12	6	69	...
Isabela, 2,281—Zamboanga Basilan Lumber Hospital	Gen	Church	100	...	...	...	...
Jolo, 5,790—Sulu Sulu Public Hospital	Gen	NPAssn	24	...	...	...	...
Kabasalan, —Zamboanga Pathfinder Estate Hospital	Gen	Gov't	46	...	10	...	...
Kiangnan, 270—Iligan Kiangnan Hospital	Gen	NPAssn	10	1	...	8	402
Kolambagan, 1,260—Lanao Kolambagan Hospital	Gen	Gov't	15	...	1	...	...
Laong, 38,409—Ilocos Norte Sallie Long Read Memorial Hospital	Gen	NPAssn	30	...	...	...	...
San Antonio Hospital	Gen	Church	40	...	2	...	...
Legaspi, 52,756—Albay Albay Provincial Hospital	Gen	Gov't	18	...	1	...	...
Bicol Treatment Station	Gen	Gov't	35	...	2	...	...
Milwaukee Hospital	Gen	Gov't	250	225	...	5	102
Los Banos, 6,335—Laguna University of the Philippines	Gen	Church	50	12	6	42	1,319
Los Banos Infirmary	Gen	Gov't	26	1	2	5	359
Lubang, 226—Kalinga Lubang Public Hospital	Gen	Gov't	15	12	2	10	375
Lucena, 11,930—Tayabas Tayabas Provincial Hosp.	Gen	Gov't	80	66	3	90	2,473
Makati, 12,470—Rizal Hosp. Espanol de Santiago	Gen	NPAssn	75	25	17	121	1,603
Malaybalay, 9,608—Bukidnon Bukidnon Public Hospital	Gen	Gov't	16	7	...	14	735
Malolos, 26,444—Bulacan Bulacan Provincial Hospital	Gen	Gov't	45	41	6	87	1,406
Mandahuyong, 6,335—Rizal Insular Psychopathic Hosp.	Gen	Gov't	800	...	...	...	...
Mandaua, 21,464—Cebu Eversley Childs Treatment Station	Gen	Gov't	780	1,005	...	2	198
Manila, 285,306—Rizal Bilibid Hospital	Gen	Gov't	300	...	6	...	...
Chinese Hospital	Gen	NPAssn	150	...	18	...	...
Hospital de San Juan de Dios	Gen	Church	272	...	36	...	...
Manila Sanit. and Hosp.	Gen	Church	70	29	6	68	1,307
Mary Chiles Hospital	Gen	Church	70	...	12	...	...
Mary Johnston Hospital	Gen	Church	100	...	20	...	...
Maternity and Children's Hospital	Gen	Church	77	...	65	...	...
Philippine General Hospital	Match	Gov't	714	669	64	4,837	21,741
St. Joseph's Hospital	Gen	Gov't	75	30	10	100	1,427
St. Luke's Hospital	Gen	Corp	150	118	10	274	3,525
St. Paul's Hospital	Gen	Church	100	60	14	322	2,426
St. Theresa's Hospital	Gen	Indiv	65	...	10	...	...
Sampaloc Maternity Hosp.	Gen	Indiv	25	...	10	...	...
San Lazaro Hospital	Gen	Gov't	977	970	...	...	12,121
Sternberg General Hospital	Gen	Army	317	193	...	171	2,957
Margosatubig, —Zamboanga Hospital	Gen	Gov't	18	...	...	...	...
Matl, 6,440—Davao Matl Emergency Hospital	Gen	Gov't	6	1	...	1	6
Naga, 9,336—Camarines Sur Hospital Virgen Milagrosa	Gen	Indiv	45	15	10	41	306
Naga Hospital	Gen	Gov't	22	...	...	...	...

Key to symbols and abbreviations is on page 1195

PHILIPPINE ISLANDS—Continued

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Olongapo, —Zambales							
Camilla Simpson Hospital... Gen	City		19	4	6	19	193
Paracale, 6,378—Camarines Norte							
General Hospital Gen	Corp		40	25	2	20	934
Pasay, 18,823—Rizal							
Harrison Hospital Gen	Indiv		30	18	5	30	524
Mercy Hospital Gen	Indiv		25	5	5	33	162
Port Lamon, —Surigao							
Port Lamon Hospital Gen	Corp		11	5	..	..	95
Puerto Princesa, 5,827—Palawan							
Puerto Princesa Hospital... Gen	Gov't		16	..	..	..	..
Quezon, 2,636—Tayabas							
Philippine Army Gen. Hosp. Gen	Army		120	..	..	..	1,892
Sagada, 167—Bontoc							
St. Theodore's Hospital.... Gen	Church		50	21	6	14	1,011
San Carlos, 41,820—Occidental Negros							
San Carlos Milling Company							
Ltd. Hospital Gen	NPA'ssn		15	..	5	..	..
San Fernando, 19,853—La Union							
Bethany Hospital Gen	Church		26	..	4	..	..
Pampanga Provincial Hosp. Gen	Gov't		50	..	8	..	..
San Jose de Buenavista, 20,750—Antique							
Antique Provincial Hospital Gen	Gov't		16	..	6	..	..
San Juan del Monte, 6,618—Rizal							
Manila Heights Hospital... Gen	Indiv		100	..	..	..	..
San Miguel, 18,147—Bulacan							
Eladia Memorial Hospital... Gen	County		12	4	1	14	198
San Pablo, 31,214—Laguna							
San Pablo Hospital Gen	City		20	..	..	..	..
San Roque, —Cavite							
Cosen Hospital Gen	Part		12	..	8	..	..
San Ramon Hospital Gen	Indiv		14	3	10	29	82
Santa Barbara, 30,113—Iloilo							
Western Visayas Treatment							
Station Lepro	Gov't		250	..	..	..	..
Santa Cruz, 14,151—Laguna							
Laguna Provincial Hospital. Gen	Gov't		55	40	7	37	1,326
Silay, 23,065—Occidental Negros							
Silay Maternity and Child-							
ren's Hospital Gen	City		21	..	6	..	..
Sorsogon, 17,049—Sorsogon							
Sorsogon Provincial Hospital Gen	Gov't		14	9	4	31	337
Tacloban, 15,478—Leyte							
Bethany Hospital Gen	Church		40	15	2	71	509
Leyte Provincial Hospital... Gen	Gov't		40	..	5	..	..
Tagbilaran, 12,590—Bohol							
Bohol Provincial Hospital—Gen	Gov't		75	..	7	..	..
Presbyterian Mission Hosp... Gen	Church		50	27	4	66	2,171
Tarlac, 23,886—Tarlac							
Tarlac Provincial Hospital. Gen	Gov't		35	..	6	..	..
Tayabas, 14,833—Tayabas							
Tayabas Maternity Hosp... MatCh	Gov't		12	..	4	..	..
Tuguegarao, 19,234—Cagayan							
Reyes Hospital and Clinic... Gen	Indiv		10	..	2	Estab.	1939
Vigan, 17,764—Ilocos Sur							
Ilocos Sur Provincial Hosp. Gen	Gov't		30	..	4	..	..
Philippine Christian Insti-							
tute Hospital Gen	Church		30	..	5	..	..
Zamboanga, 30,798—Zamboanga							
Brent Hospital Gen	Church		60	35	5	21	1,173
Station Hospital Gen	Army		10	3	..	..	101
Zamboanga General Hosp... Gen	Gov't		120	84	8	127	3,445

PUERTO RICO

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Agua de la, 10,952—Aguadilla							
Hospital Municipal Gen	City		17	..	..	..	..
Anasco, 3,064—Aguadilla							
Municipal Hosp. of Anasco... Gen	City		16	..	3	..	..
Arecibo, 12,563—Arecibo							
Clinica Dr. Susoni..... Gen	Indiv		100	..	10	..	..
Municipal Hospital Gen	City		125	..	2	..	..
Barceloneta, 1,573—Arecibo							
Barceloneta Municipal Hosp. Gen	City		35	35	..	35	2,400
Bayamon, 12,956—San Juan							
Bayamon Charity District							
Hospital Gen	Gov't		279	..	35	Estab.	1939
Hosp. Municipal de Bayamon Gen	City		39	..	..	..	..
Cabo Rojo, 4,605—Mayaguez							
Hospital Municipal Gen	City		25	17	..	51	327
Caguas, 19,791—Guayama							
Clinica San Rafael..... Gen	Indiv		65	22	4	24	699
Cayey, 5,933—Guayama							
Clinica Dr. Villeneuve..... Gen	Indiv		12	..	12	..	..
Central Aguirre, —Guayama							
Aguirre Hospital Gen	NPA'ssn		33	16	2	15	476
Ciales, 1,750—Arecibo							
Hospital Municipal MatCh	City		29	..	..	..	..
Pajaro, 7,222—Humacao							
Coombs Hospital Indus	NPA'ssn		39	29	..	..	955
Luis Manuel Canton Hosp... Gen	City		33	29	4	232	1,492
Guayama, 19,953—Guayama							
Tuberculosis Hospital TB	Gov't		109	95	..	..	251

PUERTO RICO—Continued

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Gurabo, 3,468—Humacao							
Municipal Hospital Gen	City		11	10	1	55	6
Humacao, 7,937—Humacao							
Clinica Oriente Gen	Part		30	13	3	19	49
Ryder Memorial Hospital... Gen	Church		50	32	8	61	14
Jayuya, 4,868—Ponce							
Catalina Figueras Memorial							
Hospital Gen	City		14	10	6	11	26
Juana Diaz, 2,466—Ponce							
Municipal Hospital Gen	City		45	40	2	53	17
Juncos, 5,297—Humacao							
Hospital Municipal Gen	City		16	..	..	..	..
Lares, 3,049—Aguadilla							
Clinica San Jose..... Gen	Indiv		8	..	2	..	..
Las Piedras, 1,333—Humacao							
Las Piedras Municipal Hosp. Gen	City		16	..	..	..	..
Loiza, 1,606—Humacao							
Loiza Municipal Hospital... Gen	City		18	14	..	56	8
Manati, 7,449—Arecibo							
Hospital Municipal Manati. Gen	City		60	..	..	..	..
Mayaguez, 37,060—Mayaguez							
Clinica Betances Gen	Indiv		70	38	6	15	7
Mayaguez and Western							
Polyclinic Gen	Part		100	60	2	12	54
Tuberculosis Hospital TB	Gov't		200	140	..	..	..
Naguabo, 4,087—Humacao							
Municipal Hospital Gen	City		36	30	2	110	17
Ponce, 53,430—Ponce							
Asylum for the Blind..... Inst	Gov't		100	95	..	..	57
Clinica Quirurgica del Dr.							
Pila Gen	Corp		198	51	10	48	186
Hospital Municipal Valentin							
Tricocoe Gen	City		107	99	12	114	353
Santo Asilo de Damas Hosp. Gen	Church		90	..	..	..	..
St. Luke's Memorial Hosp. Gen	Church		75	49	4	79	102
Tuberculosis Hospital and							
Center TB	Gov't		312	..	..	..	..
Rio Piedras, 15,408—San Juan							
Clinica Dr. M. Julia N&M	Indiv		150	125	..	..	..
Insular Leper Colony Lepro	Gov't		80	..	..	..	..
Insular Tuberculosis Sanat... TB	Gov't		820	800	..	..	5,153
Psychiatric Hospital of							
Puerto Rico Ment	Gov't		1,000	..	..	..	..
Sanatorio de la Sociedad							
Espanola de Auxilio Mutuo							
y Beneficencia de Puerto							
Rico Gen	NPA'ssn		150	40	25	57	1,343
Salinas, 2,352—Guayama							
Hospital de Salinas..... Gen	City		40	..	6	..	..
San Juan, 114,715—San Juan							
Capital City Hospitals..... Gen	City		304	..	..	..	..
Clinica Diaz Garcia..... Gen	Corp		81	53	6	27	174
Clinica Miramar Gen	Indiv		100	39	5	9	49
Contagious Disease Hospital Iso							
Hospital San Jose..... Gen	Gov't		50	15	..	..	25
Instituto Medico Quirurgico							
Gen NPA'ssn	Corp		132	74	14	48	152
Ophthalmic Institute of							
Puerto Rico Indus	Corp		50	40	..	..	125
Presbyterian Hospital..... Gen	Church		115	59	12	45	523
Puerto Rico Sanatorium..... Gen	Indiv		16	11	16	192	54
Station Hospital Gen	Army		101	70	..	8	99
University Hospital of the							
School of Tropical Medi-							
cine..... Gen	Gov't		60	..	..	Reopen	1
Santurce, —San Juan							
Hospital Minerva Gen	Indiv		100	69	15	57	67
Utundo, 4,758—Arecibo							
Clinica San Miguel..... Gen	Indiv		50	..	3	..	..
Vega Baja, 4,784—Arecibo							
Dr. J. M. Armaiz's Hospital Gen	Indiv		15	3	2	8	13
Vega Baja Municipal Hosp... Gen	City		25	..	6	..	..
Vieques, 3,191—Humacao							
Municipal Hospital Gen	CyCo		40	..	10	..	..
Yabucoa, 3,841—Humacao							
Yabucoa City Hospital..... Gen	City		24	..	2	..	..
Yauco, 8,607—Mayaguez							
Clinica "El Amparo"..... Gen	Indiv		82	1	1	2	4
Yauco Hospital Gen	City		59	..	..	..	..

VIRGIN ISLANDS

Hospitals, Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Average Census †	Basins	Number of Births	Admissions †
Charlotte Amalie, 7,626—St. Thomas Island							
Municipal Hospital Gen	CyCo		100	55	12	119	77
Christiansted, 3,767—St. Croix Island							
Christiansted Municipal Hos-							
pital Gen	City		54	45	5	65	184
Richmond Hospital Ment	City		50	49	..	..	..
St. Croix Hospital for							
Leprosy Lepro	City		92	73	..	2	5
Frederiksted, 2,766—St. Croix Island							
Frederiksted Municipal Hosp. Gen	City		62	41	11	14	170

Key to symbols and abbreviations is on page 1195

ESSENTIALS OF A REGISTERED HOSPITAL

Prepared by the Council on Medical Education and Hospitals of the American Medical Association

General Statement.—Hospitals should be organized and conducted primarily for the purpose of providing facilities where the sick and the injured of the community may be given scientific and ethical medical care.

Registration is a basic distinction between all recognized hospitals and those that are refused recognition. It is a prerequisite to the consideration of a hospital for approval for intern training or for residencies in specialties.

The registration of hospitals, the approval of hospitals for intern training, approval for residencies in specialties, and all other service of the Association regarding hospitals is carried on by the Council on Medical Education and Hospitals. Separate essentials have been adopted for each of these types of approval.

It is the desire of the Council to cooperate in every way for the improvement of hospital service, whereby the sick and injured may be provided with scientific and ethical medical care.

The Council does not have nor does it assume legal authority over any hospital. It recognizes clearly that the officers in charge of such institutions have the unquestioned right to conduct the hospitals in any way they may deem wise. If a hospital desires to have its name appear on the American Medical Association Hospital Register and thus have the recognition of that Association, it should be willing to comply with the principles which the Council on Medical Education and Hospitals considers necessary.

I. Organization.—1. The organization should consist of a supreme governing body qualified to administer a hospital. This may be a board of trustees or directors, a partnership or an individual. Such a board, partnership or individual must assume final authority and responsibility for the administration.

2. There must be a well qualified executive officer who may be designated as administrator, superintendent or director or by some other title. This person should be responsible to the governing body for carrying out its policies. The executive officer should be assisted by competent personnel adequate to the needs of the institution.

II. Physical Plant.—1. The hospital plant should consist of modern, safe buildings maintained in a sanitary condition, provided with fire protection, preferably fireproofed, and adequately equipped and furnished for the comfort of patients. Equipment for diagnosis and treatment should be reasonably complete for all types of work the staff purports to carry on in the hospital.

2. Institutions accepting surgical and obstetric patients should provide a modernly equipped operating room, a delivery room and a nursery, all suitably safeguarded. Hospitals that are strictly limited in the service they offer are not expected to have the complete organization and equipment of a general hospital.

III. Medical Staff.—1. Since the medical staff is the most important factor in the delivery of medical service to patients, too great care cannot be exercised in the selection of staff members. The staff should be limited to physicians holding the degree of doctor of medicine from medical colleges acceptable to the Council on Medical Education and Hospitals, having satisfactory qualifications as to training, licensure and ethical standing, and to dentists who are graduates of recognized dental colleges and whose professional ability and standing are known to the medical staff.

2. Osteopaths, chiropractors and other cult practitioners outside the scope of regular medicine, or unethical physicians, may not be permitted to use the hospital's facilities. They may not enter data on the records, carry out diagnostic procedures or treatments, or in any way assist in doing this work.

3. The form of organization of the staff is determined by the size and the activity of the hospital in accordance with its needs.

4. In very small hospitals where there are few physicians and where an elaborate organization is not practicable, there should still be some authority competent to pass upon the qualifications of those who seek to use the hospital's facilities. Particular care should be exercised in the assignment of surgical privileges since it is essential for the safety of patients that both the surgeon and his assistants be properly qualified.

5. Where further organization is needed it should consist of such officers as president, secretary and others; and committees, such as executive, medical records and credentials, elected or appointed according to the constitution and by-laws.

6. Staff sections such as medicine, obstetrics and surgery, should be organized as may seem wise.

7. Staff meetings should be held for the review of the work of the hospital, the discussion of results, the reports of autopsy and pathologic studies, the presentation of papers and such other matters as concern the professional work of the hospital.

8. Minutes of all staff meetings and attendance records shall be kept by the secretary.

IV. Pathology and Laboratory Diagnosis.—1. The laboratory facilities should provide as complete a service as is practicable.

2. The pathologist should preferably be a physician who holds the certificate of the American Board of Pathology. Where it is not possible to employ the services of a pathologist directly, arrangements should be made for a consulting service for tissues, postmortem examinations and the interpretation of the more difficult tests and examinations in clinical pathology. All surgical tissues should be examined, described and diagnosed by a pathologist.

3. The laboratory should be equipped for all routine procedures and for whatever additional tests and examinations are frequently called for by the staff.

4. At least one well trained clinical laboratory technician should be employed.

5. Reports of all work done should be kept on file.

6. **Autopsies.**—Every effort should be made to secure consent for the performance of autopsies. They should be conducted by a qualified pathologist or under his supervision, and protocols, including clinical summaries, should always be filed.

V. Radiology.—1. The responsibility for all radiologic examinations must rest on the physician-roentgenologist who is head of the department. His findings and conclusions for all examinations should be placed in the patient's chart. Nothing in this provision should preclude additional study and interpretations by qualified attending physicians on the staff.

2. The physician-roentgenologist should be preferably one who is a diplomate of the American Board of Radiology or a physician whose qualifications are acceptable to the Council on Medical Education and Hospitals of the American Medical Association.

3. It shall not be the policy of the hospital to make a profit from the department of radiology.

VI. Anesthesia.—The anesthesia service should be under the direction of competent medical personnel. If a qualified specialist in anesthesiology is not available, supervision may be assigned to some member of the staff who has had special training in this field or to a nurse anesthetist whose qualifications are acceptable.

VII. Nursing Service.—1. A competent nursing service should be provided, adequate for complete coverage for both day and night periods, and for surgical and obstetric supervision. All nursing should be supervised by registered graduates. Hospitals that do general surgery should have a trained operating room nurse.

2. **Dietetics.**—The services of one or more graduate dietitians, as may be required, should be available for supervision of regular and special food services. Where graduates cannot be employed, these functions should be assumed by some competent person.

VIII. Pharmacy.—The handling of drugs should be properly supervised and should comply with all the legal regulations. Accurate records should be maintained. A qualified person should be placed in charge, preferably a graduate pharmacist; whatever arrangement is made, all prescriptions should be filled by a graduate pharmacist.

IX. Medical Records.—1. An adequate record system should be maintained. No certain forms are recommended since require-

ments vary greatly according to the size and type of hospital. Samples of suitable forms for all departments may be readily obtained from publishers of hospital records.

2. Case histories and physical examinations should be recorded immediately following the patient's admission. In no case should it be longer than twenty-four hours after admission. The history, physical examination, routine laboratory work and provisional diagnosis should be recorded before an operation except in emergencies. The attending physician is directly responsible for the accuracy and completeness of case records, whether prepared by him or by another.

3. The usual case record consists of identification data, chief complaint, past medical history, family history, history of present illness, physical examination, provisional diagnosis; special reports such as consultations, clinical laboratory, pathology,

x-ray and the like; medical or surgical treatment, progress notes, final diagnosis, condition on discharge and follow-up records; autopsy report when available.

4. No case record should be filed until it is complete and then only after it has been reviewed and signed by the attending physician.

5. Monthly and annual analyses of services to patients should be made in order that the staff may be in a position to improve its service.

X. *Ethics.*—In order that a hospital may be eligible for registration it will, of course, be expected that the staff and management conform to the principles of medical ethics of the American Medical Association with regard to advertising, commissions, division of fees, secret remedies, extravagant claims, overcommercialization and in all other respects.

ANESTHESIA SERVICE IN HOSPITALS

In recent years there has occurred a renewed interest in medical anesthesia incident in a large part to the establishment of the certifying board. With it has come an intensified desire on the part of physicians and hospitals to elevate the scientific, professional and administrative standards of departments of anesthesiology. Out of these efforts grew the following Principles of Relationship between Anesthetists and Hospitals endorsed by the Council on Medical Education and Hospitals of the American Medical Association in June 1938, having previously been approved by the American Hospital Association and a committee representing the American Society of Regional Anesthesia, the Associated Anesthetists of the United States and Canada, the American Society of Anesthetists and the Eastern Society of Anesthetists:

It is recognized that anesthesia is a necessary service to the patient requiring highly trained skill for its administration; that the number of physicians specializing in anesthesia is small, and that few are found outside large communities; that trained nurse anesthetists practice legally in some states.

In view of the current discussions concerning the relationship of anesthetists to hospitals and because of the desirability of protecting the public, of maintaining anesthesia service of high efficiency, of safeguarding the hospitals, the hospital anesthetist, and the interests of the nonhospital anesthetist, the following principles are hereby approved by the Board of Trustees of the American Hospital Association:

1. The anesthesia service of the hospital shall be maintained primarily for the benefit of the sick.

2. The anesthesia service of the hospital should be organized as a department, under the direction of a qualified person who should be responsible for all the anesthesia of the hospital. Every hospital anesthesia department should be under competent medical direction, preferably under a qualified specialist in anesthesia who is a diplomate of the American Board of Anesthesiology or an equally qualified anesthetist.

3. If because of size or isolation or for other reasons a qualified medical specialist in anesthesia be not available, some member of the general medical staff paying particular attention to anesthesia should be in charge. If nurse anesthetist or technician administration of anesthesia be used, the physician staff member in charge should be responsible.

4. A qualified medical specialist in anesthesia is entitled to recognition as a professional member of the medical staff and as head of a hospital department.

5. The preservation of the unity of the hospital and its component departments and activities is an essential administrative principle. Central administrative supervision of the department of anesthesia can be maintained without infringement on professional rights or professional dignity.

6. No one basis of financial arrangements between a hospital and the physicians who administer anesthesia within the hospital would seem to be applicable or suitable on account of the great variation in local circumstances. The basis of remuneration

should be such as would best meet the local situation. This basis may be that of salary or private fees, of salary plus commission, or such other arrangements as will meet most effectively the needs of the local public, of the individual hospital and of the physicians administering anesthesia.

7. Nurse or technician anesthetists should be on salary and should be responsible to the hospital administration and, for professional direction, to the director of the department.

8. Hospitals and anesthetists should recognize that their primary obligation is efficient service to the patient, with the maximum economy to the patient that is consistent with quality of service. The arrangements between hospital and anesthetist and the financial arrangements with the patient should be in the spirit of these principles. Neither the hospital nor the anesthetist should exploit the patient or each other.

STUDY OF ANESTHESIA DEPARTMENTS

In June 1939 the American Board of Anesthesiology proposed an investigation of hospitals to determine the present status of anesthesia service from the standpoint of organization, departmental supervision, medical and technical personnel and the number and types of anesthetics administered. At the request of the board, the Council undertook to secure as much of this information as possible in connection with its annual census of hospitals, and accordingly the following questions were incorporated in the 1939 information blank: "Is department of anesthesia in charge of a physician? If so, give his name. Are general (inhalation) anesthetics given by nurses? Interns? Residents? Physicians specializing in anesthesia? Other physicians?"

Reports were received from 99 per cent of the 6,226 registered hospitals and a total of 5,744 furnished information concerning their anesthesia service. Of this number 2,761 indicated that the department was under the supervision of a physician, while 851 reported that no facilities were available for anesthesia. The number of departments reporting the administration of anesthetics by nurses was 2,531, by interns 678, by resident physicians 973, by physicians specializing in anesthesia 1,258, and by other physicians 3,240.

Of 4,356 general hospitals, 4,009 replied to the anesthesia questionnaire. Twenty stated specifically that no department was available, while 2,194 reported medical personnel in charge of the anesthesia service. Anesthetics were administered by nurses in 2,231 general hospitals, by interns in 598, by residents in 686, by physicians specializing in anesthesia in 1,067 and by other physicians in 2,723. Reference should be made to tables G and H, showing departments of anesthesiology classified by states, and table J, where departments have been arranged in accordance with the type of hospital service. The latter contains reports from 4,000 general

hospitals, 558 mental institutions, 451 tuberculosis sanatoriums, ninety-six maternity hospitals, seventy-nine orthopedic, fifty-seven isolation, forty-one eye, ear, nose and throat, forty-one children's hospitals, thirty-nine industrial and 373 other institutions.

In this connection it is of interest to note that eighty-seven physicians are now certified by the American Board of Anesthesiology, 234 limit themselves to anesthesia and 466 specialize in this field without complete restriction of practice. From the Directory Department of the American Medical Association the following

TABLE G.—Departments of Anesthesiology Classified by States

States	Number of Hospitals	Number Reporting on Anesthesia	Number of Departments Reporting							No Anesthesia
			M.D. in Charge	Anesthesia Administered by						
				Nurses	Interns	Residents	M.D. Specialists	Other Physicians		
Alabama.....	90	24	28	47	4	9	11	52	11	
Arizona.....	58	55	28	26	1	4	10	32	10	
Arkansas.....	60	55	30	31	4	7	12	40	1	
California.....	358	332	144	102	29	77	79	181	67	
Colorado.....	99	96	45	36	8	9	17	56	17	
Connecticut.....	81	75	23	26	15	15	18	28	22	
Delaware.....	13	15	9	5	4	3	2	8	3	
Dist. of Columbia	28	25	17	4	11	9	11	9	3	
Florida.....	97	90	43	48	8	17	21	61	12	
Georgia.....	112	84	51	40	9	16	17	60	8	
Idaho.....	45	37	14	24	1	..	2	15	3	
Illinois.....	301	286	119	145	30	42	51	128	51	
Indiana.....	132	125	67	15	14	16	39	80	14	
Iowa.....	151	135	63	62	4	11	20	92	15	
Kansas.....	120	114	72	38	7	12	27	87	5	
Kentucky.....	95	91	48	16	11	18	31	56	14	
Louisiana.....	72	61	26	43	2	3	11	29	9	
Maine.....	62	56	15	31	3	6	8	31	7	
Maryland.....	80	71	28	17	14	17	20	29	22	
Massachusetts.....	249	235	118	82	52	59	76	138	34	
Michigan.....	233	228	108	106	15	42	39	127	30	
Minnesota.....	219	207	90	142	8	11	16	103	27	
Mississippi.....	97	82	31	64	1	5	8	41	6	
Missouri.....	145	135	76	43	20	34	37	75	17	
Montana.....	59	54	20	43	2	..	4	31	1	
Nebraska.....	98	90	47	66	8	7	9	64	1	
Nevada.....	16	15	4	5	..	1	4	12	1	
New Hampshire.....	44	43	13	13	1	2	12	20	5	
New Jersey.....	167	161	105	37	41	40	62	63	38	
New Mexico.....	55	52	21	28	1	7	4	36	5	
New York.....	577	535	317	133	134	156	216	268	104	
North Carolina.....	167	142	49	76	6	15	16	79	27	
North Dakota.....	53	51	18	41	..	1	2	21	3	
Ohio.....	250	239	109	63	36	47	72	140	29	
Oklahoma.....	126	111	71	38	7	14	33	75	6	
Oregon.....	72	64	24	43	2	3	6	37	3	
Pennsylvania.....	354	339	191	179	77	103	78	180	58	
Rhode Island.....	25	24	18	4	9	10	12	14	5	
South Carolina.....	59	54	20	23	5	14	9	20	9	
South Dakota.....	57	54	26	44	..	1	3	20	4	
Tennessee.....	96	92	45	35	10	13	13	60	16	
Texas.....	329	295	151	143	16	26	55	195	23	
Utah.....	34	30	14	16	4	4	4	21	7	
Vermont.....	31	31	11	6	2	1	8	19	7	
Virginia.....	110	105	49	57	15	17	13	68	13	
Washington.....	112	103	33	66	7	9	10	44	15	
West Virginia.....	81	73	40	34	8	17	10	54	4	
Wisconsin.....	226	187	68	111	11	16	17	90	54	
Wyoming.....	29	26	14	20	..	1	2	22	1	
Totals.....	6,226	5,744	2,761	2,531	678	973	1,258	3,240	851	

information has been obtained concerning the number of physicians that limit their practice to anesthesiology: 1914, 26; 1927, 112; 1934, 159; 1938, 234. Many specialize in anesthesiology yet do not limit their practice entirely to this field: 1914, 94; 1927, 355; 1934, 384; 1938, 466.

EDUCATIONAL STANDARDS

The training of medical anesthetists has followed to a large extent the usual pattern of special internships or residencies. Special courses were already in progress when the original internship list was established in 1914, and when a separate classification was made in

1927 there were nineteen hospitals that conducted training in anesthesiology in accordance with requirements then in force. As standards advanced, new changes were made in the Essentials in a Hospital Approved

TABLE H.—Departments of Anesthesiology in General Hospitals Classified by States

States	Number of Hospitals	Number Reporting on Anesthesia	Number of Departments Reporting							No Anesthesia
			M.D. in Charge	Anesthesia Administered by						
				Nurses	Interns	Residents	M.D. Specialists	Other Physicians		
Alabama.....	68	64	23	43	3	7	8	45	..	
Arizona.....	39	35	20	20	..	4	8	27	..	
Arkansas.....	49	45	25	19	5	5	10	35	..	
California.....	240	219	116	82	25	60	60	179	..	
Colorado.....	66	63	37	31	8	6	12	47	..	
Connecticut.....	37	35	18	23	13	7	12	23	..	
Delaware.....	10	10	8	5	4	3	2	6	..	
Dist. of Columbia	16	16	14	3	11	6	9	5	..	
Florida.....	76	70	40	42	7	16	21	55	1	
Georgia.....	93	77	45	41	8	14	17	55	1	
Idaho.....	39	31	13	23	..	..	2	22	..
Illinois.....	206	196	94	129	29	28	46	105	..	
Indiana.....	69	63	45	10	14	9	31	62	..	
Iowa.....	116	105	42	54	4	5	18	77	..	
Kansas.....	95	90	59	34	7	9	24	69	..	
Kentucky.....	70	63	39	16	10	14	25	48	..	
Louisiana.....	53	48	21	38	2	3	10	24	..	
Maine.....	49	44	13	28	3	4	6	29	..	
Maryland.....	45	39	23	14	12	14	17	21	..	
Massachusetts.....	143	136	80	64	41	29	65	136	..	
Michigan.....	161	144	86	92	14	34	28	90	1	
Minnesota.....	167	156	75	132	6	6	30	83	..	
Mississippi.....	84	72	23	47	1	5	8	58	1	
Missouri.....	94	94	60	35	19	26	35	69	..	
Montana.....	53	50	20	40	2	..	3	27	..	
Nebraska.....	87	84	45	61	8	3	9	59	..	
Nevada.....	15	14	4	5	..	1	4	12	..	
New Hampshire.....	35	35	13	13	1	2	12	28	..	
New Jersey.....	90	90	77	28	40	23	52	43	..	
New Mexico.....	41	38	15	27	1	4	3	27	..	
New York.....	338	317	222	116	107	104	155	215	..	
North Carolina.....	121	105	41	71	5	12	14	70	..	
North Dakota.....	44	43	15	39	..	1	2	17	..	
Ohio.....	153	148	78	50	32	33	52	108	..	
Oklahoma.....	105	91	58	26	5	9	20	63	..	
Oregon.....	53	53	14	38	2	3	3	22	..	
Pennsylvania.....	228	222	157	155	70	80	57	129	..	
Rhode Island.....	13	13	3	3	7	6	9	12	..	
South Carolina.....	45	40	19	25	5	13	9	23	..	
South Dakota.....	52	49	23	43	..	..	6	19	..
Tennessee.....	64	60	35	30	7	7	12	50	1	
Texas.....	270	257	131	124	15	15	57	180	1	
Utah.....	28	25	12	25	3	3	2	19	..	
Vermont.....	23	22	9	5	3	1	8	16	..	
Virginia.....	81	80	40	54	15	14	27	56	..	
Washington.....	80	74	26	56	7	5	10	38	..	
West Virginia.....	64	62	32	31	6	15	10	40	..	
Wisconsin.....	141	138	60	103	11	12	16	77	..	
Wyoming.....	25	22	11	18	..	1	1	18	..	
Totals.....	4,556	4,009	2,194	2,231	598	686	1,067	2,723	20	

TABLE J.—Departments of Anesthesiology Classified According to Type of Service

Type of Service	Number of Hospitals	Number Reporting on Anesthesia	Number of Departments Reporting							No Anesthesia
			M.D. in Charge	Anesthesia Administered by						
				Nurses	Interns	Residents	M.D. Specialists	Other Physicians		
General.....	4,556	4,009	2,194	2,231	598	686	1,067	2,723	20	
Nervous and mental.....	600	558	189	38	22	118	38	162	257	
Tuberculosis.....	450	451	117	44	6	37	62	67	273	
Maternity.....	118	96	41	69	12	18	14	54	5	
Industrial.....	40	39	32	14	4	14	6	20	1	
Eye, ear, nose and throat.....	41	41	25	18	6	11	9	22	4	
Children's.....	43	41	15	22	9	17	10	11	7	
Orthopedic.....	82	79	31	31	4	11	11	19	20	
Isolation.....	69	57	13	9	8	8	12	17	23	
Other.....	401	373	169	55	9	23	29	147	207	
	6,226	5,744	2,761	2,531	678	973	1,258	3,240	551	

Schools Approved for Training Clinical Laboratory Technicians by the Council on Medical Education and Hospitals

Under the column headed "Name and Location of School" enclosures in parentheses denote affiliations. The abbreviation *Br. fee*, under "Tuition," indicates breakage fee.

Name and Location of School	Director	Entrance Requirement	Duration of Course	Time of Admission	Number of Students Enrolled	Tuition	Certificate, Diploma, Degree
ARKANSAS							
University of Arkansas School of Medicine (University Hospital), Little Rock	E. L. Wilbur, M.D.	2 yrs. coll.	12 mos.	Oct.	4	\$100	Certificate, Diploma, Degree
CALIFORNIA							
Children's Hospital, Los Angeles	C. M. Hyland, M.D.	Coll. degree	12 mos.	Quarterly	3	None	Certificate
College of Medical Evangelists (White Memorial Hospital), Los Angeles	O. B. Pratt, M.D.	2 yrs. coll.	12 mos.	Sept.	6	\$100	None
Los Angeles County Hospital, Los Angeles	N. G. Evans, M.D.	Coll. degree	12 mos.	.....	12	\$60 (Br. fee)	Certificate
Collis P. and Howard Huntington Memorial Hospital, Pasadena	A. G. Ford, M.D.	Coll. degree	12 mos.	July	4	\$10 (Br. fee)	None
St. John's Hospital, San Francisco	Z. E. Hollin, M.D.	2 yrs. coll.	12 mos.	Varies	3	\$180 (Br. fee)	Certificate
St. Zion Hospital, San Francisco	C. Weiss, M.D.	Coll. degree	12 mos.	Quarterly	4	None	None
University of California Hospital, San Francisco	L. C. Schumacher, M.D.	2 yrs. coll.	12-16 mos.	Varies	4	None	None
COLORADO							
Children's Hospital, Denver	E. I. Dobos, M.D.	2 yrs. coll.	12 mos.	Sept.	37	None	Certificate
University of Denver, School of Science and Engineering, Denver	R. E. Nyswander, Denn.	High sch. grad.	4 yrs.	Sept.	37	\$225 yr.	B.S.
FLORIDA							
Florida State Hospital, Chattahoochee	W. P. Stove, M.D.	3 yrs. coll.	12 mos.	June	3	None	Certificate
GEORGIA							
Grady Hospital, Atlanta	W. B. Matthews, M.D.	Coll. degree	12 mos.	Quarterly	12	None	Certificate
University of Georgia School of Medicine, Augusta	E. R. Pund, M.D.	Coll. degree	12 mos.	Sept.	2	\$100	Certificate
Emory University, Emory University	R. R. Kracke, M.D.	Coll. degree	18 mos.	Oct.	10	\$225 & \$3 (Br. fee)	M.S.
ILLINOIS							
Michael Reese Hospital, Chicago	K. M. Howell, M.D.	3 yrs. coll.	12-15 mos.	Monthly	12	\$100	Certificate
Mt. Sinai Hospital, Chicago	I. Davidson, M.D.	2 yrs. coll.	18 mos.	Varies	7	\$180	Diploma
Northwestern University School of Medicine (Pasavant Memorial Hospital), Chicago	J. E. Pieper, Ph.D.	2 yrs. coll.	12 mos.	Every 6 wks.	8	\$30	Certificate
Providence Hospital (coll.), Chicago	J. H. Lewis, M.D.	2 yrs. coll.	12 mos.	Oct.	3	\$100	Certificate
Evansston Hospital, Evanston	E. L. Benjamin, M.D.	Coll. degree	12 mos.	Feb. & July	4	\$100	Certificate
St. John's Hospital, Springfield	E. W. Light, M.D.	2 yrs. coll.	12 mos.	Varies	6	\$30	None
St. Theresa's Hospital, Waukegan	E. A. Fribram, M.D.	2 yrs. coll.	12 mos.	Varies	2	\$100 (Br. fee)	Diploma
INDIANA							
Indianapolis City Hospital, Indianapolis	H. C. Thornton, M.D.	2 yrs. coll.	18 mos.	Varies	3	\$30	Certificate
Indiana University School of Medicine (Indiana University Hospitals), Indianapolis	C. G. Culbertson, M.D.	Coll. degree	12 mos.	July	3	None	None
Methodist Episcopal Hospital, Indianapolis	H. M. Banks, M.D.	Coll. degree	24 mos.	July	3	None	Certificate
South Bend Medical Laboratory, South Bend	A. S. Giordano, M.D.	2 yrs. coll.	18 mos.	Jan. & July	3	\$125	None
KANSAS							
Bellevue Hospital, Kansas City	W. W. Summerville, M.D.	Coll. degree	18 mos.	March & Aug.	3	None	Certificate
University of Kansas Hospitals, Kansas City	C. J. Weber, M.D.	Coll. degree	12 mos.	July	9	None	Certificate
St. Francis Hospital, Wichita	O. A. Hellwig, M.D.	2 yrs. coll.	12 mos.	Sept.	4	\$150	Diploma
KENTUCKY							
St. Joseph's Hospital, Lexington	E. S. Maxwell, M.D.	2 yrs. coll.	12 mos.	Jan. & Sept.	4	\$150 & \$10 (Br. fee)	Certificate
University of Kentucky, Lexington	M. Scheraga, D.V.M.	High sch. grad.	4 yrs.	Feb. & Sept.	77	\$98 yr. & Br. fee	B.S.
Kentucky State Department of Health, Louisville	E. S. Greenwood, M.D.	2 yrs. coll.	12 mos.	Sept.	18	\$300 & \$10 (Br. fee)	Diploma
St. Joseph Infirmary, Louisville	H. M. Wester, M.D.	2 yrs. coll.	12 mos.	Sept.	3	\$150	None
St. Mary and Elizabeth Hospital, Louisville	H. M. Wester, M.D.	2 yrs. coll.	12 mos.	Sept.	2	\$135	None
LOUISIANA							
Lovola University, New Orleans	J. G. Arnold, Jr., Ph.D.	High sch. grad.	5 yrs.	Sept.	50	Univ. fees	B.S.
T. L. Schumpert Memorial Hospital, Shreveport	W. P. Butler, M.D.	2 yrs. coll.	12 mos.	Feb.	3	\$30	Diploma
MAINE							
Central Maine General Hospital, Lewiston	J. Gottlieb, M.D.	Coll. degree	15 mos.	Quarterly	5	\$100	Certificate
MARYLAND							
Mercy Hospital, Baltimore	H. T. Collenberg, M.D.	2 yrs. coll.	20 mos.	Sept.	12	\$150 & \$10 (Br. fee)	Certificate
MASSACHUSETTS							
Shamons College, Boston	C. M. Hillard, A.B.	Coll. degree	12 mos.	Sept. & Jan.	3	\$200	Certificate
Mercy Hospital, Springfield	J. P. Dwyer, M.D.	2 yrs. coll.	12 mos.	Quarterly	5	Br. fee	Certificate
Worcester City Hospital, Worcester	R. H. Goodale, M.D.	2 yrs. coll.	12 mos.	Every 2 mos.	6	None	Diploma
Worcester State Hospital, Worcester	J. M. Looney, M.D.	Coll. degree	12 mos.	Varies	2	None	Certificate
MICHIGAN							
Leda V. Post Montgomery Hospital, Battle Creek	A. A. Humphrey, M.D.	Coll. degree	12 mos.	Jan., June & Aug.	3	\$25 (Br. fee)	Certificate
Mercy Hospital, Bay City	W. G. Gamble, Jr., M.D.	2 yrs. coll.	12 mos.	Jan. & July	3	\$150	B.S.
City of Detroit, Detroit	O. A. Barnes, M.D.	3 yrs. coll.	12 mos.	July & Oct.	6	\$100	Certificate
Grace Hospital, Detroit	C. F. Owens, M.D.	2 yrs. coll.	12 mos.	Jan., May & Sept.	10	\$120 & \$10 (Br. fee)	Certificate
Henry Ford Hospital (Wayne University), Detroit	F. W. Hartman, M.D.	Coll. degree	12 mos.	Varies	10	\$20	Diploma
Wayne University, Detroit	D. H. Kaupman, M.D.	Coll. degree	12 mos.	Varies	3	None	Certificate
Woman's Hospital, Detroit	D. W. Greaser, Ph.D.	High sch. grad.	4 yrs.	Sept.	63	Univ. fees	B.S.
Michigan State College, East Lansing	D. C. Beaver, M.D.	2 yrs. coll.	12 mos.	July & Oct.	6	\$20 & \$10 (Br. fee)	B.S.
College of St. Scholastica, St. Mary's Hospital, Duluth	W. G. Gault, M.D.	High sch. grad.	4 yrs.	July	3	None	B.S.
St. Luke's Hospital, Duluth	G. L. Bender, M.D.	High sch. grad.	4 yrs.	July	3	None	B.S.

Fairview Hospital, Minneapolis ¹	L. Baker, M.D.	2 yrs. coll.	12 mos.	Jan. & June	3	Certificate
Minneapolis General Hospital, Minneapolis	E. C. Andrus, M.D.	Coll. degree	24 mos.	Every 2 mos.	18	None
Swedish Hospital, Minneapolis	C. R. Drake, M.D.	2 yrs. coll.	24 mos.	April & Oct.	8	Certificate
University of Minnesota, Minneapolis ¹	W. A. O'Brien, M.D.	High sch. grad.	4 yrs.	Oct.	273	B.S.
Charles T. Miller Hospital (Macalester College), St. Paul	K. Ikeda, M.D.	3 yrs. coll.	12 mos.	July	6	B.A.
MISSISSIPPI						
Vicksburg Sanitarium, Vicksburg ¹⁹	L. S. Lippincott, M.D.	2 yrs. coll.	24 mos.	Varies	6	Certificate
MISSOURI						
Kansas City Health Department Laboratories, Kansas City ²⁰	B. E. Duncan, M.D.	2 yrs. coll.	18 mos.	Monthly	15	Certificate
Worship Hospital, Kansas City ²¹	R. Kortschoner, M.D.	Coll. degree	12 mos.	Varies	3	None
Reverend Hospital, Kansas City	F. C. Carr, M.D.	2 yrs. coll.	12 mos.	Every 2 mos.	6	None
St. Luke's Hospital, Kansas City	R. W. Kerr, M.D.	Coll. degree	12 mos.	Varies	8	Certificate
St. Luke's Hospital, Kansas City	F. C. Helwig, M.D.	2 yrs. coll.	16 mos.	Every 2 or 3 mos.	9	None
St. Mary's Hospital, Kansas City	C. G. Leitch, M.D.	Coll. degree	12 mos.	July	3	Certificate
Honor G. Phillips Hospital for Colored, St. Louis ¹	S. H. Gray, M.D.	2 yrs. coll.	18-24 mos.	Quarterly	6	None
St. Louis City Hospital, St. Louis ¹	S. H. Gray, M.D.	2 yrs. coll.	15 mos.	Quarterly	31	None
St. Louis University School of Nursing, St. Louis ²¹	H. Pinkerton, M.D.	High sch. grad.	4 yrs.	Jan. & Sept.	21	B.S.
Murray Hospital, Butte ¹	R. F. Peterson, M.D.	3 yrs. coll.	12 mos.	July & Oct.	2	B.S. ¹
College of Great Falls, Great Falls ²²	T. F. Walker, M.D.	High sch. grad.	4 yrs.	Sept.	20	B.S.
Montana State University, Missoula ²²	D. M. Hether, Ph.D.	High sch. grad.	4 yrs.	Sept.	31	B.S.
Bryan Memorial Hospital, Lincoln	M. J. Breuer, M.D.	2 yrs. coll.	12 mos.	Feb., June & Sept.	3	Diploma
Lincoln General Hospital, Lincoln	J. W. Covey, M.D.	2 yrs. coll.	12 mos.	Quarterly	4	Diploma
University of Nebraska Hospital, Omaha	J. P. Tolman, M.D.	2 yrs. coll.	12 mos.	June & Aug.	6	Certificate
Mary Hitchcock Memorial Hospital, Hastings	B. E. Miller, M.D.	3 yrs. coll.	12 mos.	Quarterly	5	Certificate
NEW YORK						
Bender Hygienic Laboratory, Albany ²¹	J. J. Clemmer, M.D.	2 yrs. coll.	12 mos.	Sept.	15	Certificate
Jewish Hospital, Brooklyn ²¹	M. Lederer, M.D.	Coll. degree	12 mos.	Quarterly	9	Certificate
Buffalo General Hospital, Buffalo ²¹	K. L. Terplan, M.D.	Coll. degree	13-15 mos.	In summer mos.	7	Certificate
Edward J. Meyer Memorial Hospital, Buffalo ²¹	D. K. Miller, M.D.	2 yrs. coll.	24 mos.	Monthly	7	Certificate
University of Buffalo (Edward J. Meyer Memorial Hospital), Buffalo ²¹	D. K. Miller, M.D.	High sch. grad.	4 yrs.	Sept.	4	B.A.
Mary Immaculate Hospital, Jamaica	E. B. Erskine, M.D.	2 yrs. coll.	12 mos.	Oct.	4	Certificate
Rochester General Hospital, Rochester ¹	I. A. Gispard, M.D.	Coll. degree	18 mos.	Varies	10	Certificate
Ellis Hospital, Schenectady ²¹	E. Kellett, M.D.	2 yrs. coll.	12-18 mos.	Varies	8	Certificate
Russell Sage College (Sumner Hospital), Troy	G. H. Kinck, Jr., M.D.	High sch. grad.	4 yrs.	Sept.	4	B.A.
NORTH CAROLINA						
Duke Hospital, Durham ¹	D. T. Smith, M.D.	2 yrs. coll.	18 mos.	Aug.	15	Certificate
Watts Hospital, Durham	T. H. Byrnes, M.D.	2 yrs. coll.	12 mos.	Jan. & July	4	Certificate
OHIO						
City Hospital, Akron	E. L. Saylor, M.D.	Coll. degree	12 mos.	July	2	Certificate
Institute of Pathology, Western Reserve University (University Hospitals), Cleveland ¹	H. Gorbunoff, M.D.	4 yrs. coll.	12 mos.	June	17	Certificate
Mt. Sinai Hospital, Cleveland	B. S. Wine, M.D.	9 yrs. coll.	12 mos.	July & Sept.	18	Certificate
Spillane-Loring University Hospital, Columbus ²¹	H. L. Delmar, M.D.	Coll. degree	12 mos.	Quarterly	6	Certificate
White Cross Hospital, Columbus ¹	R. S. Fuller, M.D.	Coll. degree	12 mos.	Jan., June & Sept.	3	Certificate
Huron Cross Hospital, East Cleveland ¹	R. G. Gooditt, M.D.	3 yrs. coll.	12 mos.	July	4	Certificate
College of Mt. St. Joseph-on-the-Ohio, Mt. St. Joseph ²¹	W. M. German, M.D.	High sch. grad.	4 yrs.	Sept.	4	Certificate
Toledo Hospital, Toledo	B. Steinberg, M.D.	Coll. degree	12 mos.	Feb. & Sept.	4	Certificate
Youngtown Hospital, Youngstown	G. B. Kramer, M.D.	2 yrs. coll.	12 mos.	June & July	2	None
St. Anthony's Hospital, Oklahoma City ²⁰	H. Jeter, M.D.	Coll. degree	12 mos.	Varies	2	None
State University and Crippled Children's Hospital, Oklahoma City	H. Jeter, M.D.	Coll. degree	12 mos.	Varies	4	None
OREGON						
Emmanuel Hospital, Portland	H. H. Foskett, M.D.	Coll. degree	12 mos.	Varies	2	Certificate
Good Samaritan Hospital, Portland	C. H. Minlove, M.D.	2 yrs. coll.	12 mos.	Every 4 mos.	4	None
Portland Sanatorium and Hospital, Portland ¹	W. C. Hunter, M.D.	2 yrs. coll.	12 mos.	Jan.	2	Certificate
St. Vincent's Hospital, Portland	T. D. Robertson, M.D.	2 yrs. coll.	12 mos.	Every 4 mos.	4	None
University of Oregon Medical School, Portland ²⁰	H. F. Lewis, M.D.	2 yrs. coll.	12 mos.	Varies	8	Certificate
PENNSYLVANIA						
Arlington Memorial Hospital, Allentown ¹	J. Ehnna, M.D.	2 yrs. coll.	18 mos.	Jan.	7	None
Allentown Hospital, Allentown	J. J. Wenner, M.D.	2 yrs. coll.	12 mos.	Sept.	2	None
Warvian College for Women, Bethlehem ²¹	D. R. Corcoran, M.A.	High sch. grad.	4 yrs.	Sept.	45	B.S.
St. Luke's Hospital, Bethlehem	H. A. Rothrock, Jr., M.D.	2 yrs. coll.	12 mos.	Sept.	3	Certificate
Ryn Mawr Hospital, Bryn Mawr ¹	M. M. Strumia, M.D.	2 yrs. coll.	15 mos.	Quarterly	4	Certificate
Hagerwald-Mercy Hospital, Darcy	P. J. Kennedy, M.D.	Coll. degree	12 mos.	July & Sept.	2	Certificate
Harrisburg Holyfamily Hospital, Harrisburg ²¹	R. M. Moffitt, M.D.	2 yrs. coll.	12 mos.	Every 4 mos.	6	Certificate
Hackensack Memorial Hospital, Danville, Lewisburg	H. H. Van Horn, M.D.	Coll. degree	12 mos.	July & Oct.	2	Diploma
Germanum Dispensary and Hospital, Philadelphia	F. B. Hunt, M.D.	High sch. grad.	4 yrs.	Feb. & July	4	B.S.
Jefferson Medical College Hospital, Philadelphia	F. B. Lynch, Jr., M.D.	2 yrs. coll.	12 mos.	Oct.	2	Certificate
Laurens Hospital, Philadelphia ¹	C. J. Bucher, M.D.	2 yrs. coll.	12 mos.	Every 2 mos.	7	Certificate
Mt. Sinai Hospital, Philadelphia	S. P. Reiman, M.D.	2 yrs. coll.	12 mos.	Feb. & Sept.	3	Certificate
St. Agnes Hospital, Philadelphia	J. H. Smith, M.D.	2 yrs. coll.	18 mos.	Varies	8	Certificate
				.....	..	\$50

Schools Approved for Training Clinical Laboratory Technicians—Continued

Name and Location of School	Director	Entrance Requirement	Duration of Course	Time of Admission	Number of Students Enrolled	Tuition	Certificate, Diploma, Degree
PENNSYLVANIA—Continued							
St. Joseph's Hospital, Philadelphia	L. A. Soloff, M.D.	2 yrs. coll.	12 mos.	Varies	3	\$120 & \$30 (Br. fee)	Diploma
Temple University (Temple University Hospital), Philadelphia	F. W. Konzelmann, M.D.	High sch. grad.	1 yrs.	Sept.	28	Univ. fees	B.S.
Albright College (Reading Hospital), Reading	E. D. Funk, M.D.	High sch. grad.	4½ yrs.	July & Sept.	16	Coll. fees	B.S.
Moses Taylor Hospital, Scranton	C. L. Mattus, M.D.	Coll. grad.	12 mos.	July & Sept.	2	None	Certificate
Seranton State Hospital, Scranton	C. L. Mattus, M.D.	2 yrs. coll.	12 mos.	July & Sept.	2	None	None
Wilkes-Barre General Hospital, Wilkes-Barre	W. L. Lanyon, M.D.	2 yrs. coll.	12 mos.	July or Aug.	2	\$50	Certificate
TENNESSEE							
Knoxville General Hospital, Knoxville	R. H. Monger, M.D.	2 yrs. coll.	12 mos.	Quarterly	1	None	Diploma
John Gaston Hospital (University of Tennessee), Memphis	H. C. Schmeisser, M.D.	Coll. degree	12 mos.	Quarterly	1	None	Certificate
TEXAS							
Hotel Dieu Hospital, Beaumont	H. B. Williford, M.D.	2 yrs. coll.	18 mos.	June & Sept.	3	Br. fee	None
Baylor University Hospital, Dallas	J. M. Hill, M.D.	2 yrs. coll.	12 mos.	Monthly	12	\$100	Certificate
St. Paul's Hospital, Dallas	J. L. Goforth, M.D.	Coll. degree	12 mos.	.....	3	\$100	Certificate
Texas Christian University (Harris Methodist Hospital), Fort Worth	J. L. Audujart, M.D.	High sch. grad.	4 yrs.	June & Sept.	5	\$200 yr.	B.S.
John Sealy Hospital, Galveston	M. Bodmann, M.D.	2 yrs. coll.	12 mos.	Varies	8	\$150	Certificate
St. Joseph's Infirmary, Houston	A. H. Braden, M.D.	2 yrs. coll.	12 mos.	.....	3	\$30	Diploma
Robert B. Green Memorial Hospital, San Antonio	W. V. Knoll, M.D.	2 yrs. coll.	12 mos.	Varies	7	\$200	None
UTAH							
University of Utah School of Medicine, Salt Lake City	O. A. Ogilvie, M.D.	High sch. grad.	4 yrs.	Sept.	32	Univ. fees	B.S.
VIRGINIA							
Hospital of St. Vincent de Paul, Norfolk	A. F. Strauss, M.D.	2 yrs. coll.	18-21 mos.	Sept.	6	\$180 & \$10 (Br. fee)	Certificate
College of William and Mary, Richmond	R. C. Beck, M.D.	High sch. grad.	4 yrs.	Sept.	10	Coll. fees	B.S.
Medical College of Virginia Hospital Division, Richmond	J. H. Scherer, M.D.	2 yrs. coll.	18 mos.	Sept.	10	\$150	Certificate
Stuart Circle Hospital, Richmond	R. O. Beck, M.D.	B.S.	12 mos.	Every 1 mos.	3	\$251	Diploma
WASHINGTON							
State College of Washington (St. Luke's Hospital, Spokane), Pullman	V. Burke, Ph.D.	High sch. grad.	1½ yrs.	Feb. & Sept.	20	Coll. fees	B.S.
King County Hospital, Seattle	C. R. Jensen, M.D.	2 yrs. coll.	12 mos.	Varies	3	\$10	Certificate
Deaconess Hospital, Spokane	G. A. C. Snyder, M.D.	2 yrs. coll.	12 mos.	July	2	None	None
Sacred Heart Hospital, Spokane	M. M. Patton, M.D.	Coll. degree	12 mos.	Jan. & July	3	\$10 (Br. fee)	None
St. Luke's Hospital (State College of Washington, Pullman), Spokane	R. F. E. Stier, M.D.	3½ yrs. coll.	12 mos.	Feb. & Sept.	4	\$15	Certificate
St. Joseph's Hospital, Tacoma	C. R. McCall, M.D.	2 yrs. coll.	18 mos.	April & Sept.	2	\$30 & \$15 (Br. fee)	Certificate
Tacoma General Hospital, Tacoma	C. P. Larson, M.D.	Coll. degree	12 mos.	June	2	None	Certificate
WISCONSIN							
St. Francis Hospital, La Crosse	W. E. Bayley, M.D.	2 yrs. coll.	18 mos.	.....	2	\$50	Certificate
Madison General Hospital, Madison	L. McGary, M.D.	Coll. degree	12 mos.	Oct.	2	None	Certificate
St. Mary's Hospital, Madison	S. R. Pessin, M.D.	2 yrs. coll.	18 mos.	Varies	3	\$25	Certificate
University of Wisconsin (State of Wisconsin General Hospital), Madison	W. D. Stovall, M.D.	High sch. grad.	1 yrs.	Sept.	14	Univ. fees	B.S.
Milwaukee Hospital, "The Passavant," Milwaukee	H. K. B. Allebach, M.D.	2 yrs. coll.	12 mos.	Sept.	3	\$25	Certificate
St. Joseph's Hospital, Milwaukee	J. C. Grill, M.D.	2 yrs. coll.	24 mos.	July	4	None	Certificate
Milwaukee County Hospital, Wauwatosa	J. C. Grill, M.D.	2 yrs. coll.	24 mos.	July	4	None	Certificate

5.1.0%

- a. Adults male students.
- b. A one year course leading to an M.S. degree is also offered. A D.S. degree is required for admission.
- c. Out of state students are charged \$24 a year.
- d. Students from other than affiliated colleges need have degree.
- e. From Wayne University, Detroit, or Michigan State University, East Lansing.
- f. Out of state students pay \$20 a year.
- g. From Duluth State Teachers College, Duluth, or Hamline University, St. Paul.
- h. Includes twelve months training in x-ray.
- i. From Montana State College, Bozeman, or Montana State University, Missoula.
- j. Students may also be admitted after spending three years at the University of Tokyo.
- k. Covers laundry, lunches, breakage and material.
- l. Covers bookkeeping fee and materials used.
- m. Credit may be applied toward D.S. degree following three years at the College of William and Mary.
- n. Students from other than affiliated college need have degree.

ADDITIONAL AFFILIATIONS

1. Pasadena Clinical Laboratory, Pasadena.
2. St. Joseph's Hospital, Denver.
3. St. Mary's Hospital and St. Anthony Hospital, Denver.
4. American Jewish Archives and Synagogue of the Jewish Consump-
tion Relief Society, Spivak and others.
5. Richmond County Public Health Laboratory
University Hospital, Augusta.
6. Crawford W. Long Memorial Hospital and
Emory University.
7. Forsyth Hospital and St. Joseph Hospital,
Forsyth, Bend.
8. Lexington Clinic, Lexington.
9. G. M. Sannitum Hospital, Lexington Clinic,
Public Health Center, and Public Service Labo-
ratory, Lexington.
10. Louisville City Hospital, St. Anthony's Hos-
pital, and St. Joseph Infirmary, Louisville
and others.
11. Hotel Dieu—Sisters Hospital, Mercy Hospital,
and Dr. J. T. Nix Clinic, New Orleans.
12. St. Augusta General Hospital, Augusta; Brun-
son Hospital, Brunswick; and Bedford Community
Hospital, Bedford.
13. Boston Dispensary, Fairbury Hospital, and
St. Joseph Hospital, Boston.

13. Wassermann Laboratory, Boston.
14. Calhoun County Health Department and Community Hospital, Battle Creek.
15. Bay City General Hospital and Clinical Laboratories, Bay City, and Mercy Hospital, Cadillac.
16. City of Detroit Receiving Hospital, Grace Hospital, Providence Hospital, and Women's Hospital, Detroit, and Eloise Hospital—Dr. Wm. J. Seymour Hospital, Eloise.
17. Woman's Hospital, Detroit; Eloise Hospital—Dr. Wm. J. Seymour Hospital, Eloise; Hurley Hospital, Flint; Bledgett Memorial Hospital, Grand Rapids and others.
18. Minneapolis General Hospital and University Hospitals, Minneapolis, and Ancker Hospital, St. Paul.
19. Mississippi State Charity Hospital, Vicksburg.
20. Kansas City General Hospital, Kansas City.
21. General Hospital, Kansas City.
22. Tuberculosis Hospital, Kansas City.
23. Firmin Desloge Hospital, Mt. St. Rose Sanatorium, and St. Mary's Hospital, St. Louis.
24. St. Mary's Hospital and Walker Laboratories, Great Falls, Minn.
25. St. Mary's Hospital, Butte, and Montana General, Butte.

24. Anthony N. Brady Maternity Hospital and Memorial Hospital, Albany, and Hudson City Hospital, Hudson.
25. Children's Hospital, Buffalo.
26. Laboratory of the City and County of Schenectady, Schenectady.
27. Grant Hospital and St. Francis Hospital, Columbus.
28. Good Samaritan Hospital, Cincinnati, and Good Samaritan Hospital, Dayton.
29. State University and Crippled Children's Hospital, Oklahoma City.
30. Doernbecher Memorial Hospital for Children and Multnomah Hospital, Portland.
31. Allentown Hospital, Allentown State Hospital and Sacred Heart Hospital, Allentown; St. Luke's Hospital, Bethlehem; and Easton Hospital, Easton.
32. City Board of Health Laboratories, Harrisburg.
33. St. Theresa Hospital, Beaumont, and St. Mary Hospital, Dallas.
34. Dr. Wm. H. Grosser, Letterman Sanitarium, Letterman, and Holy Cross Hospital, west bank of Lake Superior, Duluth.
35. Medical College of Virginia, Richmond, and University of Virginia, Charlottesville.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 30, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

GROWTH OF INTERNSHIPS AND RESIDENCIES

The institutional apprenticeship that was the forerunner of the present system of training interns was introduced in the United States nearly a hundred and fifty years ago. For more than a century it remained in an unprogressive stage; indeed, it did not emerge into its modern phase until 1904, following the formation of the Council on Medical Education. Since that time the internship has been influenced by the standards of the Council. New growth began and was accelerated after the establishment of an approved list of hospitals offering internships in 1914. Hospitals themselves soon found a growing need for the service of interns to meet the educational requirements of the Council and the standardization program of the American College of Surgeons. Not until 1923, however, did available internships begin to equal approximately the number of medical graduates. Since 1923 all graduates in medi-

cine have been able to obtain this type of practical experience in an acceptable institution.

Recent years have seen an actual excess of internships in relation to the number of graduates from American medical schools. Their availability is modified however by other factors, such as the employment of Canadian and foreign graduates and the growing tendency among interns to remain for a second year of service. Thus in 1938 it was found that only 317 vacancies remained unfilled although 7,373 internships were approved and 5,194 medical students graduated from American schools. In 1939 the number of such vacancies was 344. While present demands for interns do not greatly exceed the supply, it is nevertheless apparent that internships have reached a saturation point and that new hospitals may find it difficult to attract suitable graduates. Vacancies occur mainly in the small private hospitals, many of which are discontinuing their intern service in favor of second year assignments under the classification of mixed residencies.

New hospitals which contemplate entrance into the educational field should consider a mixed residency program before establishing internships either independently or in affiliation with other institutions. There is moreover the possibility that general resident physicians may be secured on a regular employment basis wholly outside the scope of an educational service.

Residencies in specialties, although usually considered of recent date, actually originated also in the early institutional apprenticeships. First they were designated as special internships and remained in that category until 1927, when a separate residency list was established.

Most striking is the phenomenal growth of residency training that has occurred since the House of Delegates of the American Medical Association authorized the recognition of certifying boards in 1933. Within the last five years, for example, the number of residencies has increased from 2,373 to 4,709. There were 1,776 positions available in 1927 and 428 special internships in 1914.

In 1938 the residency classification was extended to include fellowships. At present there are thirty branches and subdivisions of medicine in which specialty training has received recognition by the Council on Medical Education and Hospitals. These groups, however, are classified among the twelve specialty boards and the two affiliates of the American Board of Surgery, namely the boards of anesthesiology and plastic surgery.

Residencies in specialties have been inspected and classified by the Council since 1928. Cooperative study and appraisal are now effected by the Council on Medical Education and Hospitals cooperating with ten of the specialty boards and the American College of Physicians. This program of collaboration has progressed rapidly during the last two years. Originally it was undertaken with the American Board of Radiology, then with pathology and anesthesiology and more recently

with the boards of pediatrics, psychiatry and neurology, orthopedic surgery and dermatology and syphilology. Similar arrangements are now being completed with the American Board of Internal Medicine, the American Board of Urology and the American Board of Obstetrics and Gynecology.

HOSPITAL SERVICE IN THE UNITED STATES

This issue of *THE JOURNAL* is devoted in large part to the presentation of data concerning the hospitals of the United States. For nineteen years the Council on Medical Education and Hospitals, through its annual census, has collected and made available a wealth of information concerning the number and location of hospitals and the character of the service which they render. This year's comprehensive report includes some new and special features, of which one of the most important is the analysis of hospital facilities of each state according to ownership and according to the type of service. It is now possible to learn, at a glance, all the important facts regarding the hospital service of any state without the necessity of collating figures from two separate tabulations. Another feature, which adds materially to the usefulness of the Register, is the designation by a symbol of those hospitals which have fully met the standards of the American College of Surgeons and which, therefore, may be presumed to be qualified, in respect to personnel, organization and equipment, to provide in an acceptable manner all the services generally expected of a hospital.

A special feature this year is a study of anesthesia as conducted in hospitals. In recent years this branch of medicine has grown so rapidly and has so increased in complexity that hospitals have encountered difficulty in meeting the demands of the profession.

Attention is called to the extraordinary completeness of the hospital data presented by the Council. These have been prepared on the basis of actual returns from institutions which maintain 99.6 per cent of the beds in registered hospitals. Concerning the remainder, which represent less than a half of 1 per cent of the hospital beds, information has been secured from other sources, such as the secretary of the county medical society, the district councilor of the state society or some other physician in the locality. The accuracy of these compilations is also subjected to a rigid test in that each institution invariably looks in the Register to see how it has been recorded and promptly notifies the Council if even the slightest error is found. Statistical studies, no matter how elaborate or precise the methods, can have no greater value than the original data on which they are based. It is a pleasure to pay tribute once again to the painstaking cooperation of hospital superintendents and other officers which makes possible the unquestioned reliability and amazingly complete coverage of each annual report on hospital service in the United States.

Even the most reliable figures, however, may be misused. As an illustration there are some who have computed the ratio of general hospital beds per thousand of population in highly industrialized communities and assume that adequate medical care can be rendered everywhere by establishing a like ratio of beds per thousand throughout the entire country, wholly ignoring the differences in social and domiciliary conditions as well as in habits and inclinations of the people. The table on page 1162 shows rather conclusively that where there are the greatest number of hospital beds in proportion to the population the beds are in most constant use and, conversely, that in states having the smallest number of hospital beds per thousand the utilization of these beds is lowest. One cannot escape the conclusion that hospitals have been built where the need for them was recognized and means for their supply were available.

THE VOLUNTARY HOSPITAL

The United States is not the only country in which there is some agitation for a complete state system of hospital services. As is pointed out by Mr. A. V. J. Hinds,¹ of Great Britain, this is a thought that occurs to any individual who finds himself subjected to the visitation of the collectors for the nonprofit voluntary hospitals. It disturbs also the people who have been contributing to hospitals in the past and now find their taxes so great that they must cut down their contributions. Indeed, governmentally minded persons themselves in their agitation for a discontinuance of voluntary hospitals urge that complete administration by the state would free many people from these personal annoyances. Of course persons who are interested in hospitals from the point of view of professional relationships might feel that the benefits to be derived from freedom of action are worth considerably more than any annoyance that might result from the existence of the voluntary system. It has yet to be established, moreover, that a state system could operate with more efficiency or at a lesser cost.

Mr. Hinds examines the arguments in behalf of both the voluntary hospitals and a state system. He considers particularly the arguments of those who insist that hospital service should be like the disposal of sewage, the provision of water and education—state-managed services wholly. He comes to the ultimate conclusion that no government would today advocate taking over the voluntary hospitals in Great Britain. They are doing the work efficiently and, as far as the taxpayer is concerned, free of charge. In Great Britain, as in this country, there are already many governmentally owned and managed institutions. One need but consult the tables made available in this special issue of *THE JOURNAL* to see how large a place such institutions have come to occupy in the American

1. Hospital Testament, by A. V. J. Hinds, The University Press, Liverpool, Hodder & Stoughton Ltd., London, 1939; sixpence net.

scheme. But the private hospital still has a responsibility of its own! It can offer values not inherent in any governmentally managed institution. These are the values on which Mr. Hinds places special emphasis. The general public owes, he points out, much more to the hospital service than merely the care of the individual sick. It is on the privately owned hospitals that the community must depend for a trained medical profession, both specialist and general practitioner. The records show that without a doubt the voluntary hospitals have been the most important of the sources of advancement in medical science.

The ultimate justification for the continuance of the voluntary hospital system as a permanent feature of medical services lies, the British leaders point out, in the association of the voluntary hospitals in teaching and research, but especially because such association is the best guaranty of an alert and enterprising medical profession. On the existence of a medical profession of high standards depends the efficiency of hospital treatment, the advance of medical science and the maintenance of high standards in every medical function.

Continuing in this vein of philosophic thought, Mr. A. V. J. Hinds writes:

It is clear that hitherto the voluntary hospitals have always attracted to themselves the most brilliant medical men. The merit of their organization is that they do in fact create rather than attract the best men. The width of experience available to the Honorary engaged partly in private practice and partly in hospital work has already been emphasized, but there is an important aspect of it that needs elaboration. The Honorary's work for the hospital, as doctor, teacher and research worker, must be maintained at the high standard which is necessary to provide him an income in his private practice. If the quality of his hospital work deteriorates, his reputation is damaged and his private practice suffers. He thus has a constant incentive to achieve distinction which would be lacking if he were a salaried officer of the hospital, an incentive to give of his best to his hospital work—which is a public service—in order to benefit his private work which is his livelihood. Furthermore, his eminence in his profession is maintained only by the confidence of those he serves, and the persons who have the greatest say in giving him employment as a consultant in a private case are the general practitioners, members of his own profession who are judging him as expert.

The complete analysis of the situation leads our British colleagues to a six point statement, in which Lord Dawson of Penn joins Mr. Hinds:

1. The voluntary hospitals ensure that only the best brains of the medical profession are accorded distinction, by subjecting them to the rigorous test of recognition by their practicing colleagues engaged in the same work in the same profession. They do not obtain positions of eminence as a result of selection and promotion decided solely by a political body or a lay administrator.

2. The voluntary hospitals ensure that the best brains of the medical profession are not only at the command of the wealthy but are also at the service of the public as practitioners in the hospitals. The benefits of first-rate medical attention are not confined to one class of the community.

3. The voluntary hospitals ensure that the best brains of the medical profession are not only engaged in the practice of medicine but are also at the disposal of the public as university teachers of medicine. There is no separation of the practical work from the teaching of it.

4. The voluntary hospitals ensure that for the performance of these public services the medical profession is remunerated,

not by fixed salary, but indirectly by the rewards of private practice, in such a way, therefore, as to provide the maximum incentive for the achievement of excellence. There is no danger that a hospital appointment or a teaching appointment will be regarded as a sinecure.

5. The voluntary hospitals ensure that the teaching of medicine in the universities, and research into new methods of treatment in the hospitals, are guided and controlled by independent laymen whose loyalty to a single purpose permits and inspires them to provide the funds required for a bold policy of advancement in research. There is not the necessity to confine expenditure along the lines imposed by direct responsibility to the masses of the public.

6. The voluntary hospitals ensure that in one of the most important spheres of social life there is a variety of approach, on the one hand by public bodies, and on the other by private and voluntary institutions. The existence side by side of the two types of effort affords a useful basis of contrast, and a stimulus to friendly and healthy rivalry. Experiment of every kind is easier for the private and voluntary agency, but both types benefit from the results of research which proves itself successful.

The voluntary hospitals in Great Britain have been undergoing many vicissitudes similar to those that threaten ours, perhaps to some extent even greater because of the degree to which the state in Great Britain has already entered into medical service. Today the voluntary hospitals in Great Britain are appealing to the public for their very lives, asking individual citizens to give of their utmost to sustain institutions whose unique gift to public life is bound up with their dependence on the efforts of the individual citizen. Sentiment alone might well be sufficient to urge support because an altruistic people has always recognized that the care of the sick is a fundamental spiritual motive. But here now are conclusive scientific arguments to support the appeal to sentiment with an appeal to reason—one which every free citizen of a free-minded country must heed if he would sustain those institutions which are in themselves a symbol of freedom.

Current Comment

THE REGISTRY FOR CLINICAL LABORATORY TECHNICIANS

In 1928 the American Society of Clinical Pathologists established a Registry to pass on the qualifications of laboratory technicians and to approve schools for training these workers. Soon this registry received the recognition of the American Medical Association, the American College of Surgeons, the American Hospital Association, the Catholic Hospital Association and other scientific and medical organizations. The Council on Medical Education and Hospitals was authorized to formulate standards and approve schools which meet its requirements. After a thorough test, conducted by clinical pathologists, successful applicants for a certificate were designated as Medical Technologist (M.T.), a title which connoted a holder of a certificate of competence from the Registry, nationally recognized in the medical and hospital spheres. Within the past six months one C. A. Bartholomew of Red Bank, N. J., who has never himself been registered, began

to circularize the medical laboratory technicians of New England asking them for a fee of \$5 to join the "American Medical Technologists" and offering to bestow the title M.T. by virtue of a charter from the state of New Jersey. As far as we know, this movement is not supported or authorized by any scientific body. The promoters seem, moreover, to have undertaken the task of passing on the competence of training schools for medical technologists. In this they seem to be abetted by the proprietors of some commercial schools which have not themselves been approved by the Council on Medical Education and Hospitals and the Registry. This would seem to be the old technic of having one soiled hand wash the other. Graduates from these unapproved schools who are ineligible for the Registry's examination seem to be welcomed into the "American Medical Technologists." Indeed, a teacher of one of these schools has, it is reported, solicited its graduates to join this organization at reduced rates. Complaints have come to both the Council and the Registry against the efforts of this unauthorized and irresponsible body to undermine the scientific and ethical standards that have been set up for the practice of this important vocation by the American Medical Association and the American Society of Clinical Pathologists. Certainly physicians everywhere will do their utmost to inform young men and women who contemplate a career in medical technology of the hazard that lies in participation in such courses or organizations.

CHIROPRACTORS SEEK FEDERAL APPROVAL

Now the chiropractors are importuning Congress to let them try their stuff on injured federal employees entitled to benefits under the United States Employees' Compensation Act. A bill to accomplish that end, H. R. 8963, has been introduced by Representative Tolan of California and is pending in the House Committee on the Judiciary. In support of the enactment of this bill its chiropractic proponents might, if they desire to give the committee accurate information, point to the fact that during 1939 the legislatures of five states refused to pass legislation to permit chiropractors to treat workmen's compensation cases, including incidentally the state legislature of California; that approximately 75 per cent of all chiropractors who have attempted to pass basic science examinations have miserably failed; that not a single chiropractor has qualified for licensure in the District of Columbia, after examination, since the healing arts practice act established adequate licensure requirements in 1929; that a representative chiropractor once testified under oath that he could prevent head lice by chiropractic adjustments. The osteopaths obtained favorable action by the Seventy-Fifth Congress on their bill to permit them to treat beneficiaries of the United States Employees' Compensation Act. Unfortunately the Senate had been misinformed that opposition to the bill had been withdrawn because of an amendment that was utterly meaningless. Prompt and vigorous protests filed with the House Committee on the Judiciary against enactment of Representative Tolan's chiropractic bill may prevent

a further dilution of the quality of medical care to which injured federal employees are entitled under the act that the bill proposes to amend.

EDMUND ANDREWS

After he had observed the painless extraction of teeth under the influence of nitrous oxide gas, Dr. Edmund Andrews of Chicago in 1868 published a paper pointing out principles for the use of inhalation anesthetics for prolonged surgical operations. He had conducted experiments on animals and followed them by experiments on human subjects; experiments also were performed to determine whether the addition of free oxygen to nitrous oxide gas might prevent the patient's face from turning blue. A mixture of nitrous oxide and oxygen had been proposed previously in England but apparently had never been tried. In a memorial lecture, Prof. Arno B. Luckhardt¹ reviews the experiments which Dr. Andrews performed and recalls other accomplishments. Dr. Andrews was appointed professor of anatomy at Rush Medical College in 1855 and later served in several campaigns in the Civil War. Among other activities, he illustrated his own scientific articles and painted scenes around Memphis and Vicksburg while with General Sherman's army. He designed and built a church organ. With the aid of Robert Kennicott, Dr. Andrews founded the Chicago Academy of Sciences and attracted many lecturers there, including Louis Agassiz. One of his books and many geologic papers dealt with glaciers. Eventually his time was given more and more to genito-urinary and orthopedic surgery, in which specialties he devised urethral dilators and implements of traction. Although associated with Mercy Hospital from the time of its erection, Dr. Andrews performed laboratory and surgical diagnostic procedures in his home, where he attracted a host of assistants. With Dr. N. S. Davis he is said to have established the first graded medical curriculum in the United States in the Medical Department of Lind University, which in time evolved into the present Northwestern University Medical School. Such were the medical giants of the past; it is inspiring to recall their achievements.

CENSUS OF MARRIAGES AND BIRTHS

At the coming national census a proportional cross-section of all women who are or have been married will be asked the following three questions: 1. Have you been married more than once? 2. What was the age at first marriage? 3. The number of children (excluding stillbirths) ever born? These questions are regarded by population experts, social scientists, educators and others as likely to uncover much valuable information, especially concerning the speed and character of population change, the number of children borne by the average mother today, the number expected in the future, the urban or rural distribution of births, the economic status of the home into which children are born, the number of couples failing to produce issue and many other important data. The tables to be published by the Census Bureau after the 1940 census will include most

1. Luckhardt, Arno B.: Edmund Andrews, M.D., and His "Oxide Mixtures." *Anesth. & Analg.* 10:2 (Jan.-Feb.) 1940.

if not all of the following classifications: number of children ever born according to age of mother, length of married life, education of parents, color, native or foreign born, income or occupational group, and rental or owner's valuation of home, as well as many other classifications and further breakdowns into geographic regions. This census, if adequate answers are obtained, will make a vast fund of new information available.

THAT SAL HEPATICA SURVEY

Which were the leading medical magazines that conducted the survey for the Bristol-Myers Company which permits them to say in their advertising that their survey was conducted independently by the editors of eight outstanding medical journals? According to a letter from the Bristol-Myers Company, the survey was conducted for them by the Murray Breese Associates through the following periodicals: (1) *Clinical Medicine and Surgery*; (2) *Current Medical Digest*; (3) *Eye, Ear, Nose and Throat Monthly*; (4) *Industrial Medicine*; (5) *Medical Economics*; (6) *Medical Record*; (7) *Modern Medicine*; (8) *Tri-State Medical Journal*. How good was the survey? According to a letter sent by the editor of *Clinical Medicine and Surgery* to an inquiring physician, the survey included an independent questionnaire on the letterhead of *Clinical Medicine and Surgery* which was sent to 1,000 doctors, picked at random from their list of subscribers. The periodical merely received the letters from the subscribers and sent them unopened to Murray Breese Associates. The partnership between so-called medical publications and this kind of advertising ought to interest the doctors who interest themselves in those medical journals.

THE LODGE HEALTH INSURANCE BILL

On March 19, Senator Lodge of Massachusetts proposed by S. 3630 the enactment of a National Health Act of 1940. The bill is in two parts. The first part represents a revision of a bill introduced by Senator Lodge last August. It proposes to pay cash benefits from the old age insurance fund, created under the provisions of the Social Security Act, on behalf of certain unemployed individuals who receive medical, dental or hospital care, or whose wife, child under the age of 16, or wholly dependent parent receives such care. The benefits to be thus paid may not exceed \$40 in any calendar year and are payable, on application of the individual, by the managing trustee of the old age insurance fund to the doctor, dentist or hospital rendering services. Among other conditions that must be met by an individual before the benefits may be payable is the requirement that he must have been registered as unemployed for at least four consecutive weeks at a public employment office or other agency approved by the Social Security Board. Senator Lodge estimates that this part of the bill will involve a possible expenditure of some \$15,000,000 for the first fiscal year of its operation. The second part of the bill would add a new title to the Social Security Act to be captioned Grants to States for Medical Services and Facilities. The theory from which this part of Senator Lodge's

bill stems is that there are certain standardized medical services and facilities which because of their high costs are not used in many cases in which their use is desirable. Senator Lodge proposes, therefore, federal grants to states that develop plans to provide such services and facilities free to needy persons and at a minimum cost to other persons, the federal grant to equal the amount expended by the state under the plan. The medical services and facilities that are thus to be made available, it is proposed, are x-ray treatments, respirators and any drug which is of substantial, accepted and specific value in the treatment or prevention of pneumonia, streptococcal infections, diabetes, anemia, congestive heart failure, glandular and nervous disorders, nutritional deficiency and typhoid fever. In a statement issued concurrently with the introduction of this bill, Senator Lodge indicated that he had in mind such drugs and substances as sulfapyridine, insulin, liver extract, mercurpurin ampules and suppositories, endocrine products, vitamin products and typhoid vaccine. The author of the bill emphasized the fact that his proposal does not smack of regimentation, that each individual would be accorded the privilege of selecting his own doctor and hospital and that the state plan would then come into operation by making available the designated services and facilities. Senator Lodge was unable to supply any estimate as to the probable cost of this section of his bill, which was referred to the Senate Committee on Education and Labor, before which is pending also Senator Wagner's hospital construction proposal. This measure is interesting for the thought it stimulates. Essentially part one is a sickness compensation plan for unemployed and their dependents, subject to innumerable abuses and almost impossible of regulation. Part two recognizes the catastrophic character of certain expenses associated with illness and attempts to meet them on an emergency basis. This obviously represents only one phase of a large problem.

PLACENTAL TRANSMISSION OF SULFANILAMIDE

Using rats in carefully controlled experiments, Speert¹ has recently reported observations on the placental transmission of sulfanilamide. He found that administration of this drug to rats throughout gestation results in the appearance of sulfanilamide in approximately equal concentrations in the blood streams of both mother and fetus. Prolonged administration of sulfanilamide to pregnant rats produces deleterious effects in the offspring, including increased intra-uterine and postnatal mortality, decreased litter size, diminished birth weight and selective stunting of growth. It is concluded from these studies that until the effects of sulfanilamide on the human fetus are better known the drug should be administered with extreme caution during pregnancy. The necessary observations in human beings should include a careful study of intra-uterine development, birth weight and postnatal growth in the infants born to mothers receiving extended sulfanilamide therapy during pregnancy.

1. Speert, Harold: The Placental Transmission of Sulfanilamide and Its Effects on the Fetus and Newborn, *Bull. Johns Hopkins Hosp.* 60: 139 (March) 1940.

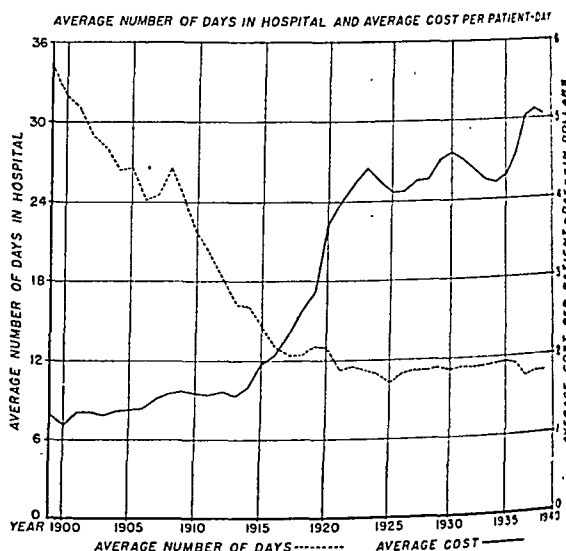
ORGANIZATION SECTION

TRENDS IN HOSPITALIZATION

It should be easy to conclude from the gradually increasing number of hospitals and hospital beds that the number of patients admitted to hospitals has steadily increased during this century. It is more difficult to determine changes that have taken place in the length of hospital stay and the cost per patient day over a long period of time. Data recently compiled from the records of the Bridgeport, Conn., Hospital indicate that at least in this hospital the length of stay has gradually shortened while the cost per patient has steadily risen. Because it is seldom possible to obtain detailed statistics of these phases of hospital operation which extend over such a long period, the report by Oliver H. Bartine, superintendent of the Bridgeport Hospital, covering forty-one years of experience, is welcome. The accompanying chart makes clear the most significant trends disclosed in this report.

The wide interest in prepayment plans for hospital care, and the general absence of long time information adds to the value of this exceptional report. This forty-one year period has apparently been one of steady growth in the size of the hospital, although exact data to show the periodic increase in the number of beds is not available. The average daily census increased from sixty-six in 1899 to 318.7 in 1939. This alone suggests that the hospital probably has many more beds now than in 1899. The average stay in the hospital in 1899 was thirty-four days. The secular trend was steadily downward until the average number of days in the hospital was only 10.3 in 1925. Since that time the average stay in the hospital has been almost level at between 11.5 and 10.4 days, indicating that the rate of this decline has slowed up and indeed almost completely disappeared since 1925. It is impossible to discover from the available data the cause of the sharp decline in the earlier years. It is possible that the population around Bridgeport became more hospital minded, that more persons having the less serious illnesses were hospitalized, and that all treatment became more efficient. No predictions of future trends can be made from the history of these forty-one years.

The daily cost per patient has constantly increased. The curve which illustrates this increase graphically shows but slight indication of flattening out. No positive conclusion is warranted to the effect that this increase will continue at the same rate, but the curve may serve to direct attention to a medical economic problem that is significant at present and may continue



Forty years of hospital experience in Bridgeport, Conn.

to be significant for some time in the future. An increase in patient day costs from \$1.32 in 1899 to \$5.04 in 1939 is obviously of sufficient significance to warrant an attempt to discover and to analyze its elements. It is possible that such an analysis might provide some valuable assistance in planning for the costs of prepayment schemes of hospitalization in the future and might also reveal the causes responsible for this mounting cost.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Bills Introduced.—S. 3607, introduced by Senator Murray, Montana, proposes to authorize the Surgeon General of the United States Public Health Service to conduct researches, investigations, experiments and studies relating to the cause, diagnosis and treatment of dental diseases and to assist and foster similar research activities by other agencies. S. 3630, introduced by Senator Lodge, Massachusetts, proposes the enactment of the "Health Insurance Act of 1940." The bill provides (1) for the payment of cash benefits, not in excess of \$40 per annum, from the old-age insurance fund on behalf of certain unemployed individuals who receive medical, dental or hospital care or whose wife, child under the age of 16 or wholly dependent parent receives such care, the cash benefits to be payable by the managing trustee of the old-age insurance fund to the doctor, dentist or hospital rendering such services;

(2) for federal grants to states that have developed plans for supplying free to needy persons and at a minimum cost to other persons, x-ray treatments, respirators and any drug which is of substantial, accepted and specific value in the treatment or prevention of pneumonia, streptococic infections, diabetes, anemia, congestive heart failure, glandular and nervous disorders, nutritional deficiency and typhoid fever. S. 3633, introduced by Senator Sheppard, Texas, proposes to amend the National Defense Act so as to eliminate the requirement of two years' practice for eligibility for appointment in the Dental Corps. H. R. 8963, introduced by Representative Tolan, California, proposes to amend the United States Employees' Compensation Act so as to authorize chiropractors to treat injured federal employees entitled to benefits under that act. This bill is pending in the House Committee on the Judiciary. H. R. 8982, introduced by Representative Richards, South Carolina,

proposes that any World War veteran suffering from paralysis, paresis or blindness or who is helpless or bedridden as the result of any disability and has been refused compensation or pension on account of charges or findings of "misconduct or willful misconduct" shall be awarded compensation.

STATE MEDICAL LEGISLATION

New Jersey

Bill Introduced.—S. 108 proposes to authorize the formation of medical service corporations to establish and operate non-profit medical service plans whereby the expense of medical

services to subscribers to said plans is to be paid by the corporation to physicians participating in such plans.

New York

Bill Introduced.—A. 2276, to amend the law granting a hospital treating a person injured through the fault of another a lien on any right of action, judgment or settlement accruing to the injured person by reason of his injury, proposes to permit the injured person to examine his hospital record. The bill also proposes that a hospital desiring to enforce the lien against a person claimed to be liable for the injury inflicted must institute an action at law within four months subsequent to the discharge of the injured person from the hospital.

WOMAN'S AUXILIARY

Colorado

The auxiliary to the Colorado State Medical Association joined with the Colorado Tuberculosis Association in sponsoring the seventh annual essay contest for the high school students of the state December 2. The contest was held in the interest of the annual Christmas Seal sale for raising funds for prevention of tuberculosis. "The Message of the Double Barred Cross" was the subject of the essays, three of which were given over the radio.

Mississippi

The auxiliary to the Delta Medical Society convened in Cleveland October 11. Members from LeFlore, Bolivar, Humphrey, Sunflower and Washington counties were in attendance. Mrs. Hugh Johnson Jr., president of the auxiliary to the Mississippi State Medical Association, outlined the objectives of the auxiliary and a donation was made to the preventorium.

New Jersey

The auxiliary to the Passaic County Medical Society met in Ridgewood October 23. Dr. Hans Wassing, of the Barnert Hospital, discussed "The Problem Child."

The auxiliary to the Bergen County Medical Society met in Hackensack November 14. Mr. James D. Moore, inheritance tax supervisor of the county, spoke on "Inheritance Taxes and Wills."

The auxiliary to the Essex County Medical Society met in Newark October 23. One hundred and eight members were present. Speakers were Drs. Edward J. Ill, Earl Snively, Charles M. Robbins and Royal A. Schaaf; Mrs. Parker O. Griffith spoke on the "Town Hall Lecture Series" and Mrs. Leo J. Hammill reviewed "The Horse and Buggy Doctor."

The auxiliary to the Hudson County Medical Society met in Jersey City November 7. Mr. George Keenan Jr., of Bayonne, spoke on the religious, political and economic situation in Europe. The Widows and Orphans Fund, which is sponsored by the auxiliary, was discussed by Mrs. Charles B. Russell, a member of the auxiliary to the Passaic Medical Society.

The auxiliary to the Ocean County Medical Society met in Beach Haven November 3. Mrs. Sara Hernberg spoke on South America.

Mrs. N. W. Currie reviewed "A Doctor Without a Country," by Dr. Thomas Lambie, at the meeting of the auxiliary to the Union County Medical Society in Scotch Plains November 8.

New York

The Woman's Auxiliary of the Rochester Academy of Medicine sponsored a "Book Fair" November 30 to December 2 at the academy building. Publishers lent about 2,000 new books, and there was a large group of rare and old books and manuscripts lent by Rochester libraries, museums, schools and individuals. Exhibits showing the processes of making book covers and illustrations, bindings, books for the blind, microfilms, book plates and reading lamps were among the subjects shown. A film entitled "The Making of a Book" was shown each morning. A collection of used books were offered for sale. Five programs of lectures were presented. Among the speakers were Samuel Hopkins Adams, Olga Samaroff Stokowski, William Rose Benét, Carl Carmer and Lewis Gannett. The executive committee in charge of the fair included Mrs. Alfred M. Wedd, chairman; Mrs. John R. Booth, Mrs. Nathan D. McDowell,

Mrs. Erastus I. Guller and Mrs. Henry B. Crawford. Members of the advisory committee were Drs. Clarence V. Costello, chairman; Warren Wooden, Stearns S. Bullen, Harold H. Baker and William W. Percy; Mr. John A. Lowe, director of public libraries of Rochester; Mr. Roland B. Woodward, executive vice president of the chamber of commerce; Arthur R. Parker, director of the Rochester Museum, and Miss Margaret Withington, librarian of the Women's College, University of Rochester.

Oregon

Dr. Vernon Douglas spoke on Health Problems of Marion County before the auxiliary to the Marion County Medical Society October 10. The members voted to place subscriptions to *Hygeia* in the 100 one room schools in Polk and Marion counties and are asking the financial support of the medical society in this project.

The auxiliary to the Harney County Medical Society, which is 100 per cent in members-at-large, reports that *Hygeia* has been placed in all schools through the efforts of the Harney County Health Association.

The auxiliary to the Multnomah County Medical Society held a Public Relations meeting in Portland recently to which members of clubs and organizations in the county were invited.

Pennsylvania

Dr. Henry T. Price, president of the Allegheny County Medical Society, Dr. Charles H. Henninger, president of the Pennsylvania State Medical Society, and Mrs. Walter F. Donaldson, past president of the auxiliary to the state medical society, were speakers at the autumn meeting of the auxiliary to the Allegheny County Medical Society.

At a meeting of the auxiliary to the Berks County Medical Society in Stouchsburg, reports of the convention in Pittsburgh were given by Mrs. LeRoy W. Frederick. The annual ball of the medical society and its auxiliary was held at the Reading Country Club November 1.

Dr. Kenneth Scott spoke on "Socialized Medicine" before the auxiliary to the Chester County Medical Society in Chester October 17.

Dr. J. Moore Campbell spoke on the "Progress of Preventive Medicine" at the October meeting of the auxiliary to the Dauphin County Medical Society.

At a meeting of the auxiliary to the Lackawanna County Medical Society in Scranton, October 10, Mrs. Harold Conrad read the play "Your Neighbor and Mine."

Dr. Frederick C. Lechner spoke on hospital insurance at the autumn meeting of the auxiliary to the Lycoming County Medical Society in Williamsport.

Dr. Rufus S. Reeves, president of the Philadelphia County Medical Society, presented "Today's Medical Problems" before the auxiliary to the Philadelphia County Medical Society in Philadelphia October 10. Following this address an illustrated talk on "The Romance of Sarah and Josiah Wedgewood" was given by Mrs. J. Bertram Hervey, president of the Philadelphia Federation of Women's Clubs and Allied Organizations.

Texas

Mrs. S. H. Watson, president of the auxiliary to the Texas State Medical Association, outlined the work of the auxiliary for the year at a meeting of the auxiliary to the Bell County Medical Society in Temple October 13.

Dr. Preston Hunt, president-elect of the Texas State Medical Association, addressed the autumn meeting of the auxiliary to the Bexar County Medical Society in San Antonio. "Physical Examination Day" was observed by the auxiliary November 10, at which time a playlet, "Being Clinicked," under the direction of Mrs. W. R. Mann, was presented.

A paper on the Wagner Bill, prepared by Dr. J. N. White, was read at the meeting of the auxiliary to the Bowie-Miller Counties Medical Society, Texarkana, November 10.

The auxiliary to the Brown-Mills-San Saba Counties Medical Society met in Brownwood October 9. A paper on "A Call to Life," as discussed in a recent issue of *Hygeia*, was read.

Dr. Holman Taylor, secretary of the State Medical Association of Texas and editor-in-chief of the *Texas State Journal of Medicine*, addressed the auxiliary to the Johnson County Medical Society, Cleburne, October 18, on "Socialized Medicine." At a meeting November 15 in Cleburne papers were read by members on "Wrongful Autopsies" and "The History of Surgery."

At a meeting of the auxiliary to the Dallas County Medical Society in Dallas, November 1, Mrs. S. H. Watson outlined the work of the auxiliary and Mrs. Leslie Moore discussed the objects and origin of the county auxiliary. Presidents of county auxiliaries of district fourteen of the state medical society attended the meeting.

Dr. Edward H. Cary discussed national legislation of interest to the medical profession before the auxiliary to the Tarrant County Medical Society, Fort Worth, October 20.

At a meeting of the auxiliary to the Wichita County Medical Society in Wichita Falls November 7, Thomas Parran's book "Shadows on the Land" was reviewed.

The auxiliary to the Fourth District Medical Society met in Brady October 18. Members from Brownwood, Winters, Comanche, Coleman, Ballinger, Santa Anna, San Angelo and Brady attended the meeting. Mrs. H. B. Allen of Brownwood was elected president of the district auxiliary. An auxiliary to the Runnels County Medical Society, which is in the fourth district, has recently been formed.

MEDICAL ECONOMIC ABSTRACTS

OREGON PLAN FOR LOW WAGE INDUSTRIAL GROUPS

The general type of any plan to furnish medical care to industrial groups in Oregon, as in Washington, is largely determined by the peculiar, but not wholly identical, form of the workmen's compensation legislation in these states and by the patterns that have been set up during more than twenty years since this legislation was enacted. The Oregon law has been interpreted as curtailing the privileges of physicians and encouraging lay organizations to enter into contract relations with industries to furnish medical care to employees. As a result of this situation numerous so-called "hospital associations" operated as business undertakings were formed and grew to dominate medical practice among workers subject to the compensation law. They extended the coverage of their contracts not only to the families of employees but to executives and others and to cover not only compensation injuries but complete medical service.

The harmful effects of this type of practice, on the quality of the medical care given to those under contract, the whole medical profession and the standards of medical practice throughout the state gave rise to widespread criticism and suggestions for more satisfactory methods of meeting the problem of medical care for low-wage industrial groups.

Several of the county medical societies established prepayment plans to supply medical care to low income groups and to undertake contracts to supply medical care to industrial employees. Although there was a considerable degree of uniformity in organization structure and benefits offered, there were a number of significant differences which created some discussion and difficulties as the plans grew and their scope extended.

The house of delegates of the Oregon State Medical Society in 1938 established certain fundamental policies to govern medical society plans. There was no attempt to force uniformity as to form of organization. As a coordinating agency the state medical society established a bureau of medical economics "composed of one representative from each of the existing and future organizations operating plans approved by the local medical societies together with the council of the Oregon State Medical Society. The duties of this bureau, which shall be carried on under the direction of the council, shall be to settle disputes arising between approved local organizations under their contracts or in their administration, and such other duties as may be assigned to it by the council.

Based on "Recommended Policies and Procedures for Providing Medical Care to Low-Wage Industrial Groups," issued by the Bureau of Medical Economics of the Oregon State Medical Society, and accompanying communication from Clyde C. Foley, executive secretary of the Oregon State Medical Society.

"The development of uniform by-laws for existing and future organizations operating plans approved by the local medical societies.

"To suggest contracts to such organizations, with particular respect to uniform provisions concerning services rendered outside the territorial limits of the local organizations.

"The drafting of schedules of rates to subscribers, sufficient to provide adequate medical care.

"The installation of uniform accounting practices among approved local organizations, as far as feasible.

"The development of forms of agreement under which approved local organizations would provide services to the subscribers of other such organizations who need care outside the territorial limits of the organization of which they are subscribers.

"The establishment of general policies for the guidance of local organizations, on such matters as the income level for subscribers, the method of approving the taking of statewide or partial statewide contracts by a given local organization, the means to be used by local organizations in making known their services to industrial groups, etc."

Approval is granted only to organizations adhering to the "ten principles" adopted by the House of Delegates of the American Medical Association. Any society deviating from these principles or from the policies of the Oregon State Medical Society, without the specific permission of the council of the state medical society, will lose its representation in the Bureau of Medical Economics.

There are wide deviations in the income limits covered in existing plans, owing to the necessity of meeting the competition of groups of nonparticipating physicians, clinics or commercial hospital associations which enforce no income level among employees and frequently include the executives and owners.

"It is recommended that a maximum income level of \$1,000 for single persons and of \$1,600 for man and wife be adopted as an objective, each local organization to be permitted to fix lower income levels, if it so desires. . . .

"The policy and program of the society contemplates the ultimate elimination of hospitalization, drugs and dental service from approved local plans and the limiting of such plans to supplying physicians' services alone. When these services are eliminated, a reduction in the fees of subscribers of local organizations should be made.

"The Oregon Association of Hospitals is interested in establishing a plan of group hospitalization. When such a plan is evolved and it is feasible to place it in effect, hospitalization should be dropped from local medical plans. At the same time, drugs and dental service should be eliminated."

Provisions are made for a uniform account system at least as to the inclusion of certain items, and for a quarterly report from each local medical society plan to the state bureau of medical economics.

OFFICIAL NOTES

THE NEW YORK SESSION

Tournament of the American Medical Golfing Association

The twenty-sixth annual tournament of the American Medical Golfing Association will be held Monday, June 10, during the time of the annual session of the American Medical Association in New York. The local golf committee—Dr. James C. Joyner, 718 Park Avenue, New York, chairman; Drs. Asa L. Lincoln, Charlton Wallace, Orrin S. Wightman and Edwin G. Zabriskie—has selected the Winged Foot Country Club, which has two champion courses and a beautiful club house, as the place for the tournament. Many prizes and trophies will be awarded. The president of the American Medical Golfing Association is Dr. George W. Hall, 8 South Michigan Avenue, Chicago; the vice presidents are Drs. D. H. Houston, Seattle, and Grayson Carroll, St. Louis, and the executive secretary is Mr. William J. Burns, 2020 Olds Tower, Lansing, Mich.



Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

State Medical Meeting in Birmingham, April 16-18.—The Medical Association of the State of Alabama will hold its annual session at the Tutwiler Hotel, Birmingham, April 16-18, under the presidency of Dr. Mercer S. Davie, Dothan, and with the Jefferson County Medical Society acting as host. The guest speakers will include:

- Dr. John B. Youmans, Nashville, Tenn., Vitamin Deficiencies in Practice.
- Dr. Frank K. Boland, Atlanta, Ga., The Treatment of Acute Intestinal Obstruction.
- Dr. Robert B. Greenblatt, Augusta, Ga., Evaluation of the Various Gonadotropic Hormones: Their Application to Female Endocrine Disorders.
- Dr. Everett S. Sanderson, Augusta, Laboratory Aids and Problems in the Diagnosis of Chancroid, Granuloma Inguinale and Lymphogranuloma Venereum.
- Dr. William Thornwall Davis, Washington, D. C., Treatment of Accommodative Squint.
- Dr. James W. Bruce, Louisville, Ky., Lead Poisoning in Infancy.
- Dr. Emmett D. Colvin, Atlanta, Emphasis of the Most Common Causes of an Increased Maternal Mortality Throughout the South: With Suggestions for Correction.

Elmer V. McCollum, Ph.D., Baltimore, will deliver the Jerome Cochran lecture on "Some Contributions of Nutritional Research to Clinical Medicine." A public meeting will be held Wednesday evening; Dr. James S. McLester, Birmingham, will discuss "The Changing Picture of Disease in the Southern States," and Dr. William A. Evans, Aberdeen, Miss., "The Doctor: What He Has Done and What He Promises to Do." The annual banquet meeting of the Alumni Association of the University of Alabama School of Medicine will be held at the Tutwiler Hotel Wednesday with Dr. Evans as guest speaker.

CALIFORNIA

New Physicians' Art Association.—The California Physicians' Art Association was recently organized with the following officers: Drs. Harold Lincoln Thompson, Los Angeles, president; Paul E. W. Wedgewood, San Diego, and Emil Seletz, Los Angeles, vice presidents; Raleigh W. Burlingame, San Francisco, treasurer; Joseph C. Savage, Los Angeles, secretary, and Francis H. Redewill, San Francisco, executive secretary. The first exhibit of the new group will be shown at the annual session of the California Medical Association in Cor-

nado, May 6-9. Physicians in neighboring states are also asked to participate in this exhibit.

Tuberculosis Meeting.—The California Tuberculosis Association will hold its annual meeting in Santa Barbara, April 11-13. The speakers will include:

- Dr. Herbert R. Edwards, New York, Legal Responsibility of the Government in the Control of Tuberculosis.
- Dr. Max Pinner, New York, Archeology of Tuberculosis and Non-caseating Tuberculosis.
- William Doppler of the National Tuberculosis Association, New York, Tuberculosis and Logic.

A symposium on the roentgen ray will be presented by Drs. Rolla G. Karshner, Los Angeles; Robert R. Newell, San Francisco; Sidney J. Shipman, San Francisco, and Reginald H. Smart, Los Angeles. Dr. Henry Chesley Bush, Livermore, will address a joint meeting with the medical societies of Santa Barbara, Kern, San Luis Obispo and Ventura counties Thursday evening, April 11. Included among the speakers on the program will be:

- Dr. Edward Kupka, Olive View, Monaldi Suction Aspiration of Tuberculosis Cavities.
- Dr. Waldo R. Oechsli, Olive View, Body Section Roentgenography in Pulmonary Tuberculosis.
- Drs. Lauren V. Ackerman and Kazuma Kasugi, San Francisco, Certain Clinical and Pathologic Aspects of Cor Pulmonale.
- Dr. Joseph E. Pottenger, Monrovia, Comparison of the Dilution-Flotation Technic with Guinea-Pig Inoculation in the Examination of Suspected Tuberculous Material.
- Drs. Roscoe C. Main, Santa Barbara, and Peter Cohen, Santa Maria, A Review of Our Tuberculosis Control Program in a Rural Community.

CONNECTICUT

Society News.—The Yale Medical Society was addressed in New Haven, February 14, by Drs. Robert M. Thomas on "Myocardial Lesions Due to Dietary Deficiency"; Joseph F. Sadusk Jr., "The Skin Eruption and False Positive Wassermann in Infectious Mononucleosis"; Daniel C. Darrow, Herman Yannet and Herbert C. Miller Jr., "Factors Controlling the Electrolyte and Water Composition of Muscles," and Gertrude van Wagenen, Ph.D., and Dr. Ralph H. Jenkins, "An Experimental Examination of the Factors Causing Ureteral Dilatation of Pregnancy."

New England Health Institute.—The New England Health Institute will be held at the Hotel Bond, Hartford, April 15-19. The institute is sponsored by the Connecticut State Medical Society, the U. S. Public Health Service, U. S. Children's Bureau, New England Tuberculosis Association, the state departments of health of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, the schools of public health of Yale University, Harvard University and Massachusetts Institute of Technology, Simmons College, the Connecticut State Nurses' Association and the Connecticut Public Health Association. Information concerning the program may be obtained from the state department of health, 165 Capitol Avenue, Hartford.

GEORGIA

Osteopaths Denied Registration Under the Harrison Narcotic Act.—An osteopath in Georgia has no right under his state license to use narcotic drugs and hence is not entitled to registration under the Harrison Narcotic Act was the conclusion reached, February 2, by the United States District Court, M. D., Georgia, Macon Division, in a suit instituted by the Georgia Association of Osteopathic Physicians and Surgeons, Inc., against the Collector of Internal Revenue. The court reviewed the licensure laws of Georgia and found therein evidence of a plain intent on the part of the legislature to deny osteopaths the right to use drugs of any kind. Apparently the board of osteopathic examiners had been issuing licenses to applicants purporting to authorize the practice of osteopathy, surgery and obstetrics, and it seems to have been contended in this case that, since the practice of surgery and obstetrics requires the use of narcotic drugs, that right should be recognized. The court, however, queried the authority of the examining board to grant any such license, since the osteopathic act provides only for licenses to practice osteopathy. The fact that that act requires applicants to be examined in surgery and obstetrics evidences no intent on the part of the legislature, the court thought, that licentiates should engage in such practice, for it may be necessary for an osteopath to have knowledge of numerous subjects in order to make a diagnosis and determine whether osteopathic treatment or other treatment is indicated. An osteopath should know, the court pointed out, when not to give an osteopathic treatment. While indicating the belief that an osteopath had no right to practice surgery and obstetrics, the court conceded that one of two things may be true: That the legislature in passing the osteo-

pathic act either did not intend to authorize the practice of surgery and obstetrics, or intended to authorize only such of that practice as could be done without drugs. Furthermore, the court said that a Georgia osteopath neither "practices medicine" nor is a "physician."

ILLINOIS

Vacancy in Division for Handicapped Children.—To fill the position of superintendent of the division for handicapped children in the state department of public welfare, applications will be received until midnight, April 7. Qualified persons must be graduates of approved medical schools; must have completed internship in an approved hospital; must have had two years training and experience in pediatrics of a quality comparable to that accepted by the American Board of Pediatrics, including one year as resident in pediatrics in a hospital approved for such residency; must have administrative ability or experience such as that evidenced by several years of successful employment in public health or welfare administration, administration of medical services for children, or other administrative work of a related character. Address the Executive Secretary, Illinois Commission for Physically Handicapped Children, 1800 West Fillmore Street, Chicago.

Chicago

Branch Meeting.—Dr. Francis M. Rackemann, Boston, will address the North Side Branch of the Chicago Medical Society, April 4, on "What the Practitioner Should Know About Allergy."

Dr. Fay Lectures at University.—Dr. Temple S. Fay, professor of neurology and neurosurgery, Temple University School of Medicine, Philadelphia, will discuss "Temperature Factors as Related to Cancer" at the University of Illinois College of Medicine, April 27. The lecture, sponsored by Alpha Omega Alpha, is open to students, faculty members and all interested persons.

Date of Fraternity Banquet.—The annual tri-chapter banquet of Eta, Nu and Xi chapters of Alpha Kappa Kappa fraternity will be held at the Chicago Athletic Club Thursday, April 4, instead of April 3 as previously announced. Dr. William F. Braasch, Rochester, Minn., will be the guest speaker and Dr. Herman L. Kretschmer the toastmaster. Dr. Braasch's subject will be "Future Trends in Medicine."

The Gehrmann Lectures.—The Gehrmann Lectures for 1939-1940 of the University of Illinois College of Medicine will be delivered by Conrad A. Elvehjem, Ph.D., department of biochemistry, University of Wisconsin College of Agriculture, Madison, Wis. His subjects will be: April 17, "Vitamins and Deficiency Diseases"; April 18, "Methods of Determining Vitamin Deficiencies," and April 19, "Vitamins and Normal Nutrition."

MAINE

Society News.—At a meeting of the York County Medical Society recently the program was devoted to a panel discussion of cardiac vascular diseases with the following speakers: Drs. John O. Piper, Waterville; Charles W. Steele, Lewiston; Eugene H. Drake, Portland, and Erastus E. Holt Jr., Portland. —Dr. Leon Babalian discussed "Ringworm of the Scalp" before the Portland Medical Club, February 6, and Dr. Joel F. Wellington, "Nephropotosis." —A clinic constituted the program for the Cumberland County Medical Society at its meeting in Bangor, February 16, and in the evening a panel discussion on pneumonia was presented. —Dr. Samuel H. Epstein, Boston, addressed the Penobscot County Medical Association, February 20, on "Epilepsy, with Newer Concepts of Therapy."

MICHIGAN

The Hickey Lecture.—Dr. Arthur C. Christie, professor of clinical radiology, Georgetown University School of Medicine, Washington, D. C., will deliver the Hickey Memorial Lecture of the Wayne County Medical Society, Detroit, April 8, on "Diagnosis and Treatment of Lesions of the Pharynx."

MINNESOTA

Symposium on Fractures.—A symposium on fractures and other trauma was presented in Minneapolis, March 7, under the joint auspices of the Hennepin County Medical Society and the Minneapolis Surgical Society. The sessions were held at the Minneapolis General Hospital and the auditorium of the Hennepin County Medical Society. In the evening Dr. James J. Callahan, Chicago, discussed "Fractured Neck of the Femur."

Society News.—Dr. Milton C. Winternitz, New Haven, Conn., gave a Mayo Foundation lecture at the Mayo Clinic, Rochester, March 7, on "Pathogenesis of Vascular Disease." —The Minnesota Pathological Society was addressed, March 12, by Drs. Winford P. Larson and Raymond N. Bieter on "Influence of Body Temperature on the Defense Mechanism in Experimental Pneumonia" and Benjamin J. Clawson, "Rheumatic Heart Disease; Analysis of 796 Cases." All are from Minneapolis.

NEW YORK

Dr. Fishbein to Give Public Lecture.—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address a public meeting at the Rochester Academy of Medicine, March 23. The meeting is to be sponsored by the academy, the Medical Society of the County of Monroe and the University of Rochester School of Medicine and Dentistry. Dr. Fishbein's subject will be "Medicine's Contribution to the Well-Being of America."

A Typhoid Carrier at 101.—Health authorities in Westchester County recently discovered a woman aged 101 who has probably been a typhoid carrier for eighty years, according to *Health News*. The fact that she was a carrier was brought to light when one of her great-grandchildren had typhoid in 1938 and another in 1939. Both children lived in the same house with the woman and she sometimes prepared meals for them, it was said. It was found that she had had typhoid eighty years ago.

New York City

Hospital News.—Final lectures in the series of lectures sponsored by the Montefiore Hospital Journal Club will be one by Dr. William Dameshek, Boston, April 1, on hemolytic anemia and one by Dr. Tinsley R. Harrison, Nashville, Tenn., May 8, on "Humeral Renal Mechanisms in Relation to Hypertension."

Plan Fellowships as Memorial to Dr. Tilney.—Formation of an organization to raise an endowment fund of \$150,000 to establish fellowships in neurology as a memorial to the late Dr. Frederick Tilney has been announced. According to the plans, the principal of the memorial fund will be in the custody of the trustees of Columbia University. Selection and assignments of research topics and the investigation of fellowships will be made by a committee, to be known as the Tilney Memorial Committee, made up of the executive officer of the department of neurology at Columbia University College of Physicians and Surgeons as chairman, the president of the board of managers of the Neurological Institute, and the dean of the medical school. The fellowships will be known as the Frederick Tilney Research Fellowships in Neurological Sciences. Fellowship activities are to be carried out at the Neurological Institute but may from time to time be transferred to any part of the world which may in the opinion of the committee provide the most favorable conditions. Subscriptions to this endowment fund may be sent to the Frederick Tilney Memorial, Inc., 610 Park Avenue, New York. Dr. Tilney, who died Aug. 7, 1938, was professor of neurology and neuro-anatomy at Columbia from 1914 until his death.

NORTH CAROLINA

University News.—Alumni of the former four year medical school of the University of North Carolina held their annual reunion in Chapel Hill, February 23. The principal speaker was Dr. John A. Ferrell, associate director of the International Health Division of the Rockefeller Foundation, who graduated in 1907. Dr. James M. Buckner, Swannanoa, was elected president. —Dr. John T. J. Battle, Greensboro, has presented a collection of forty-eight medical books to the library of Wake Forest College School of Medicine, Wake Forest. Many of the books are rare volumes more than 100 years old, it was announced.

Statewide Study of Nutrition.—A committee on nutrition representing various agencies in the state recently held a conference at the call of Dr. Carl V. Reynolds, state health officer, in Raleigh to discuss plans for improvement of the nutritional status of the people of the state. Participating agencies are the state departments of health, public welfare, public instruction and agriculture; Duke University School of Medicine; the Rockefeller Foundation; the extension division of North Carolina State College; the Medical Society of North Carolina; the University of North Carolina and the North Carolina College for Women. The first study will be conducted in

cooperation with Duke University School of Medicine in an area within 30 miles of Durham. In due course the committee plans to formulate a practical program for improving the nutrition of the whole population.

OREGON

University News.—The Dazian Foundation for Medical Research, New York, has made a grant of \$2,500 to the University of Oregon Medical School, Portland, for research on problems of the nervous system under the direction of Dr. Robert S. Dow, assistant professor of anatomy.

Society News.—A special meeting of the Clatsop County Medical Society was held in Astoria, February 9. The speakers were Dr. John H. Fitzgibbon, Portland, on "Recent Developments in the Health Program of the Federal Government"; Dr. William W. Baum, Salem, third district councilor, "Progress in Oregon in Providing Medical Care to Low Wage Groups Under Professional Control"; Mr. John J. Coughlin, attorney, "Analysis of the New Medical and Hospital Contracts of the National Hospital Association and the Oregon State Medical Society's Policies."—Drs. Herbert E. Goldsmith and Samuel G. Henricke addressed the Multnomah County Medical Society, Portland, March 6, on recent developments in prevention and treatment of contagious diseases of childhood, discussing measles and smallpox, whooping cough and diphtheria.—Dr. John W. Evans, Portland, discussed enuresis at a meeting of the Yamhill County Medical Society, McMinnville, March 5.

PENNSYLVANIA

Society News.—Dr. Roland N. Klemmer, Lancaster, addressed the Lebanon County Medical Society, Lebanon, March 12, on diagnosis of heart disease.—Raymond Adams Dutcher, Sc.D., State College, addressed the Blair County Medical Society, Altoona, February 27, on recent developments in vitamin research.

Psychiatric Meeting.—The Pennsylvania Psychiatric Society held its midwinter meeting in Harrisburg, February 27. Dr. Charles H. Henninger, Pittsburgh, president of the Medical Society of the State of Pennsylvania, made an address and the scientific speakers were Drs. Earl D. Bond, Philadelphia, and Howard K. Petry, Harrisburg, on "Shock Therapy in the Psychoses." Dr. William C. Sandy, Harrisburg, is president of the society.

TEXAS

Anniversary of Surgical Society.—The Texas Surgical Society will celebrate its twenty-fifth anniversary with a meeting at the Hotel Adolphus, Dallas, April 1-2. Guest speakers will be Drs. Loyal Davis, Chicago; Nathaniel G. Alcock, Iowa City, and Maxwell Harbin, Cleveland. Monday night, April 1, there will be a banquet honoring the surviving charter members.

Internists' Meeting.—Dr. Carl Lovelace, Waco, was elected president of the Texas Club of Internal Medicine at the annual meeting in Dallas in February, and Dr. George R. Herrmann, Galveston, secretary. Among the speakers, all of Dallas, were Drs. Fred Terry Rogers, on "Peripheral Neuritis"; Walter Grady Reddick, "Chemotherapy"; Joseph M. Hill, "Concentrated Blood Plasma (Desiccated)"; A New Process with New Applications; and Merritt B. Whitten, "The Electrocardiogram in Hypertension."

VIRGINIA

Neuropsychiatric Meeting.—Dr. Winfred Overholser, Washington, D. C., was the guest speaker at the annual meeting of the Neuropsychiatric Society of Virginia in Richmond, February 7, on psychiatry and the courts. Dr. Thomas N. Spessard, Norfolk, was elected president; Dr. William Gayle Crutchfield, Richmond, vice president, and Dr. Edward H. Williams, Richmond, secretary, reelected.

Course in Eye, Ear, Nose and Throat Diseases.—The fourteenth annual spring graduate course will be presented by the Gill Memorial Eye, Ear and Throat Hospital, Roanoke, April 1-6. The guest lecturers will be Drs. Karl S. Blackwell and Claude C. Coleman, Richmond; Grady E. Clay, Atlanta; Parker Heath, Detroit; Halstead S. Hedges, Charlottesville; Wendell L. Hughes, Hempstead, N. Y.; Chevalier L. Jackson, Philadelphia; Peter C. Kronfeld, Chicago; Dean M. Lierle, Iowa City; Lyman G. Richards, Boston; William F. Rienhoff Jr., Harry R. Slack Jr. and Frank B. Walsh, Baltimore; Clarence R. Straatsma and Deveau Blair Sulouff, New York.

Society News.—Drs. Edwin P. Lehman and Floyd E. Boys, Charlottesville, addressed the Lynchburg Academy of Medicine recently on "Control of Peritoneal Adhesions with Heparin."

—Dr. Charles C. Smith Jr., Norfolk, addressed the Northampton County Medical Society recently on "Goiter in Tidewater Virginia."—Dr. Eugene M. Landis, Philadelphia, addressed the Augusta County Medical Association, Staunton, February 7, on "Diagnosis and Treatment of Peripheral Vascular Diseases."—Drs. Julian M. Ruffin, Durham, N. C., and Frederick M. Hodges, Richmond, addressed the Roanoke Academy of Medicine, February 5, on "Treatment of Pellagra with Nicotinic Acid" and "Roentgen Therapy of Hemangiomas and Hygromas in Infants and Children" respectively.

WASHINGTON

New Executive Secretary.—Mr. Arthur Anderson, Seattle, has been appointed executive secretary of the Washington State Medical Association to succeed Mr. Jack Geoffroy, who resigned. Mr. Anderson has done newspaper and promotion work. He took office March 1.

Society News.—At a meeting of the King County Medical Society, Seattle, March 4, the speakers were Drs. Henry Odland, on "Mycotic Infection of the Hands and Feet"; Samuel T. Mercer, "General Manifestations of Arsenical Poisoning," and Homer J. Davidson, "A New Anastomosis After Pylorotomy." A symposium on "Inflammatory Lesions of the Intestinal Tract Exclusive of Diverticulitis and Ulcerative Colitis" was presented before the society, February 19, by Drs. John A. Duncan, Howard B. Kellogg, Clyde R. Jensen and Thomas W. Blake.—Dr. Homer P. Rush, Portland, Ore., addressed the Cowlitz County Medical Society, Longview, recently on "Action and Uses of Sulfanilamide."—Dr. Carl P. Wagoner, Seattle, addressed the Lewis County Medical Society, Centralia, recently on "Allergy and the Common Cold."—Dr. Walter L. Voegtlin, Seattle, discussed "Conditioned Reflex Treatment of Alcoholism" at a meeting of the Snohomish County Medical Society, Everett, recently.

GENERAL

Cancer Control Month.—President Roosevelt issued a proclamation, March 18, designating April as "Cancer Control Month," as authorized by a congressional resolution adopted in 1938. The President invited governors of the states, territories and possessions of the United States to issue similar proclamations. The medical profession, other scientific groups, all organs of opinion, including the press, the radio and the motion picture, were urged to unite during April in a concerted effort to impress on the people the necessity of a national program for the control of cancer.

Medical Library Association.—The forty-second annual meeting of the Medical Library Association will be held at the University of Oregon Medical School, Portland, June 25-27, under the presidency of Col. Harold W. Jones of the Army Medical Library, Washington, D. C. Hotel headquarters will be at the Heathman. The program will include talks on the literature of the epidemiology of plague, tularemia and Rocky Mountain spotted fever; a symposium on investigations in local medical history, and problems in bibliography based on a study of terminology in the field of nutrition.

Broadcasts on Youth and Crime.—The American Law Institute in cooperation with the educational division of the National Broadcasting Company is presenting a series of broadcasts on youth and crime under the general title "Youth in the Toils." The series began March 4 and will continue thirteen weeks on Monday evenings over WJZ and the Blue Network of the National Broadcasting Company. Dramatic episodes based on real life stories followed by brief discussions will make up the presentations. The discussions will be given by one of the jurists, sociologists and criminologists on the institute's committee on criminal justice-youth.

Laymen's Organization Against Epilepsy.—The American League Against Epilepsy, composed of physicians, announces the formation of the Laymen's League Against Epilepsy for the purpose of educating the public concerning the various aspects of epilepsy and for stimulating contributions toward research. Ordinary members pay \$1 and sustaining members \$5 annually and receive a periodical about epilepsy. Mrs. Francis B. Riggs, Cambridge, Mass., is president; Mr. Clinton H. Crane, New York, and Dr. William G. Lennox, Boston, vice presidents, and Mrs. Mary L. Fleming, Boston, secretary. Medical sponsors are Drs. Stanley Cobb and Tracy J. Putnam, Boston; Irvine McQuarrie, Minneapolis; Adolf Meyer, Baltimore; Wilder G. Penfield, Montreal, Que., and William J. Kerr, San Francisco. The office of the society is at the Harvard Medical School, 25 Shattuck Street, Boston.

Warning of Swindler and Thief.—An Ohio physician has reported a slight variation on the fraudulent repair man's racket and obtained the swindler's automobile license number. The man, calling himself a physician, appeared in this physician's office asking to sharpen scissors. He took four pairs of Stille scissors out and returned them in good condition. The physician paid him and two days later the man appeared again asking to borrow one pair to show another physician his workmanship. He did not return the scissors. The physician obtained the license number of the swindler's car, Ohio 1678 E for 1939 on a 1930 Chevrolet sedan.—Physicians are also warned of a hospital thief, who recently entered St. Mary's Hospital, Streator, Ill., and removed about \$125 from billfolds found in the surgeons' dressing room while the surgeons were operating. The thief left his hat and overcoat downstairs, went to the third floor and watched his opportunity until he was able to enter the dressing room adjoining the operating room.

Meeting on Physical Therapy.—The eastern section of the American Congress of Physical Therapy will hold a meeting in Trenton, N. J., April 10, in conjunction with the Mercer County Medical Society, the New York Physical Therapy Society and the Pennsylvania Physical Therapy Association. The speakers will include:

- Dr. Kristian G. Hansson, New York, Treatment of Bell's Palsy.
- Dr. Spencer T. Snedecor, Hackensack, N. J., Physical Therapy in Traumatic Conditions.
- Dr. Lewis J. G. Silvers, New York, Physical Therapy in Otolaryngologic Conditions.
- Dr. Madge C. L. McGuinness, New York, Refrigeration Therapy.
- Dr. William Bierman, New York, Evaluation of New Methods of Treatment in Peripheral Vascular Disease.
- Dr. Richard Kovacs, New York, Physical Therapy in General Practice.
- Dr. Thomas P. Sprunt, Baltimore, Physical Therapy in Internal Medicine.
- Dr. William H. Schmidt, Philadelphia, Physical Therapy in Pelvic Inflammatory Conditions.

CORRECTION

Karaya Gum and Junket.—In Dr. Karl D. Figley's article on "Karaya Gum (Indian Gum) Hypersensitivity" in *THE JOURNAL*, March 2, page 747, table 1, the author states that certain brands of junket are sources of contact with Karaya gum. "The 'Junket' Folks" of Little Falls, N. Y., write that there is no Karaya gum in any of the flavors of "Junket" Brand Rennet Powder or in "Junket" Brand Rennet Tablets.

Government Services

Annual Report of United States Public Health Service

Dr. Thomas Parran, following a brief introduction, opens his annual report with a consideration of the National Health Program, developed by the Interdepartmental Committee to Coordinate Health and Welfare Activities. The time seems opportune, he says, to extend the amount and scope of these services to enable every community in the country to be provided with the basic essentials for modern health service; to insure adequate general and special hospitals and other health facilities where needed; to make available satisfactory medical care for groups of the population unable to provide for such care out of their own resources, and to develop schemes for cash compensation for workers unemployed on account of sickness, comparable to those now in effect for unemployment due to economic causes. The surgeon general hopes that the Congress will give prompt and careful consideration to developing a comprehensive program for national health.

The work of the Public Health Service is divided into eight divisions, each under an assistant surgeon general. These are: (1) Division of Domestic Quarantine, (2) National Institute of Health, (3) Division of Foreign and Insular Quarantine and Immigration, (4) Division of Sanitary Reports and Statistics, (5) Division of Marine Hospitals and Statistics, (6) Division of Venereal Diseases, (7) Division of Mental Hygiene and (8) Division of Personnel and Accounts. The commissioned officers on the active list in the regular corps on July 1, 1939, totaled 440, while sixty-seven were awaiting orders. The number of assisting collaborating epidemiologists was 4,791. These employees are health officers or employees of state or local boards of health who receive nominal compensation from the federal government and furnish reports of communicable diseases received by state or local health organizations. The number of collaborating epidemiologists on the

foregoing date was forty-one. The scientific staff of the National Institute of Health comprised 303 members, who were assisted by 245 technicians and 305 other subordinates, making a total of 853, while in addition 161 persons held appointments as consultants to the staff. The grand total of employees of the United States Public Health Service on July 1, 1939, was 13,425, including the regular commissioned officers, the assistant collaborating epidemiologists, all part time employees, those employed on a per diem basis and those whose compensations are on a fee basis. The total amount of money appropriated for the Public Health Service for the fiscal year 1939 was \$16,783,550, while the total amount available in obligation was \$18,519,879.

Health conditions in the United States, the surgeon general reports, continued to improve. Maternal mortality continued to decline, making the ninth consecutive year in which a decrease has been recorded. For the first time since preliminary mortality figures have been available for an appreciable number of states the death rate from tuberculosis was less than 50 per hundred thousand population. In fact, the lowest general death rate yet recorded was that for 1938, the provisional rate recorded by the United States Census Bureau having been 10.6. The provisional infant mortality rate, 599 per thousand live births, also was the lowest on record since the birth registration area was established in 1915, and no doubt is the lowest in the history of the country. Cancer and heart disease were the only major causes of death for which higher rates were recorded in 1938. The number (14,939) of cases of smallpox reported for the United States, however, was exceeded only by one country in the civilized world—India. The incidence of smallpox has been increasing in the United States since 1930, when about 5,000 cases were reported. This situation, the surgeon general says, reveals curious public indifference to the presence of a disease which can be controlled easily. Typhus fever has come to be an important disease in the United States, which country now is last in the number of cases reported in a list including China, Morocco, Poland, Egypt, Tunisia and Rumania.

Weil's disease was recognized for the first time in New Jersey and Nevada. Dogs from Nevada, New York and Pennsylvania were found to be suffering from the disease, and rats captured in New York were found to harbor a virulent strain of the causative organism. New foci of Rocky Mountain spotted fever were noted in some Eastern states. This disease has now been reported in all but seven states.

The National Cancer Institute purchased nine and a half grams of radium and lent the entire amount to hospitals and other institutions for the treatment of cancer patients.

This was the first full year of operation of the Venereal Disease Control Act and federal funds allocated to the states for the control of venereal disease amounted to \$2,400,000, supplementing \$4,300,000 derived from state and local sources. Free antisyphilitic drugs for the treatment of the medically indigent are now being distributed to physicians in all the states, and in an increasing number of states drugs are being distributed without cost to physicians, regardless of the economic status of the patients. Nineteen states have passed laws requiring applicants for marriage licenses to obtain a physical examination, including a blood test for syphilis; fifteen states require blood tests for syphilis on all expectant mothers.

The Public Health Service continued to cooperate with several state health departments in technically supervising WPA projects for the sealing of abandoned bituminous coal mines. Since 1935, more than 3,900 mine units have been sealed and the amount of sulfuric acid discharged by draining water into streams has been reduced by 350,000 tons a year. The service cooperated with the WPA in providing sanitary outdoor toilets for homes, schools, dairies and other places. It has been said that 44 per cent of the population in the United States was not served by sewers at the close of the calendar year 1936, at which time it was estimated that 11,000,000 sanitary toilets were needed to serve this population. During the year, 435,562 sanitary privies were installed. From Dec. 16, 1933, to June 30, 1939, a total of 2,202,581 sanitary toilets have been installed.

The Public Health Service continued to render consultation service on request to state and local health departments in the development of industrial hygiene. There are now twenty-five active industrial hygiene units in state health departments; in 1936 there were only four. Surgeon General Parran urgently recommends that added funds be made available to the states and to the division of industrial hygiene of the National Institute of Health for purposes of conducting adequate industrial hygiene programs.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 24, 1940.

Precautions Against Air Raids

Sir John Anderson, the minister in control, inspected a demonstration of civil defense exercises so extensive that it included seven southern counties. The object was to test the system devised for furnishing help to places which had suffered so heavily from air raids that they were unable to cope with them by means of their own resources. A total of 15,000 persons were engaged in the operations while another 2,000 stood by in various outside districts in readiness if required. The ambulances, fire engines and other vehicles which poured into the area numbered 1,050. The "casualties" numbered 4,000. Each casualty bore a card indicating the injuries received, and the workers were required to fill in the treatment given and the action taken at the hospital. The two seaports Portsmouth and Gosport are situated on an island and sort of peninsula respectively. To meet this, mobile hospital units to the number of sixty-five were employed. Each one was staffed by a doctor and eight nurses and was fully equipped with surgical instruments and anesthetics. If necessary, a major operation could be performed. The handling and evacuation of casualties was watched by Mr. F. Rock Carling, assistant consultant adviser in surgery to the minister of health, as chief umpire. Two hospital trains were used for evacuation of the casualties. A street fire in which all the street mains were supposed to have been destroyed and the firemen had to obtain their water supply from canvas reservoirs was also staged. At the close of the day Sir John Anderson said that he was greatly impressed with the efficiency of the work.

Social Reform in the West Indian Islands

One example of the complete calm with which Britain faces what is probably the greatest catastrophe of the world is a scheme of social reform for the colored population of some of her colonies, involving a large annual grant and a new departure in colonial administration. The government commission appointed in 1938 under the chairmanship of Lord Moyne to investigate conditions in Barbados, British Guiana, British Honduras, Jamaica, the Leeward Islands, Trinidad and Tobago has presented its report. The West Indies are inhabited by a mixed race derived mainly from Europe, Africa, East India and China, which has settled there during the last three centuries. They are suffering from a slump due to competition in their export market, which is aggravated by a 50 per cent increase of population in the last forty years. As there has not been a proportionate increase of home-grown produce or of the exchange value of exports, poverty has followed. The commission recommends a British grant of \$5,000,000 a year for a long-term program of social reform—an entirely new departure in colonial administration. Hitherto colonial social services have had to be paid for out of colonial budgets. Far reaching public health reforms are projected. They include a greater and more varied production of food for local consumption. This is to be obtained by improvement in agriculture, for which an inspector general of agriculture is to be appointed. The West Indian peasant is to be enabled to get a better return from his land. The output of meat, milk, poultry, eggs, fish and fresh vegetables is to be increased. At least one school of hygiene should be created for research and teaching, particularly for the training of sanitary inspectors and health visitors. The medical services should be reorganized to secure a preventive outlook. Immediate progress in preventive mea-

asures, including housing, general sanitation, control of malarial areas, maternity and child welfare work, venereal disease clinics, school medical services and better education of the public in hygiene and nutrition, is necessary.

PARIS

(From Our Regular Correspondent)

Feb. 11, 1940.

Health Service by Rail

Modern war has created new problems. Armies and the evacuation of large civilian centers constitute grave epidemic hazards. The government has decided to construct specially equipped trains to meet the new situation. These trains have from sixteen to eighteen coaches and are divided into three sections: a hygienic welfare section, a laboratory section and a personnel-housing section. The health section consists of a tank coach that furnishes sterilized water, another that supplies heat, a coach intended for changing clothes, another for disinfection, another for disinsectization and one for shower-baths. Disinfection is done by means of Leeling bags. Steam furnished by the locomotive is introduced through the opening of the bag, driving the air downward without mixing with it. Hats, shoes and other articles are disinfected by means of sulfuration in special enclosures. The laboratory section consists of coaches in which equipment is installed for refrigeration, centrifugation, sterilizing, the preparation of culture mediums and animal care. The section housing the personnel has all the comforts needed by those who must live in this way for several weeks. Mobility, adaptability and rapid applicability of prophylactic measures to a large number of persons are the characteristics of these sanitary trains designed for villages containing evacuated portions of the population, for troops in the field, for railway stations on the frontiers and for ports of entry where infections are found on shipboard. The inventors of these trains are Dujarric de la Rivière and R. Puget, who discussed the subject before the Academy of Medicine.

The Tubercle Bacillus in Hospitals

Fernald Bezançon, Paul Braun and A. Mayer presented to the Academy of Medicine the results of their investigations of the number of the Koch bacillus found in the dust of hospital rooms and on objects which tuberculous patients use during hospital confinement. Exploration of the pharynx and the nasal chambers of the personnel attending patients did not disclose the presence of the bacillus. Samples taken of the room dust disclosed no colonies in spite of repeated cultures. Mica screens used by physicians in the course of radioscopic examinations were found to carry no germs. Ameuille, incidentally, had noted the same thing in a guinea pig test.

It was formerly thought that tuberculosis wards were abundantly impregnated with bacilli. The conclusions arrived at by these investigators are that wherever careful prophylactic measures are instituted the bacillus is found only in small quantities and that infections are by far more likely to occur from direct and prolonged contacts in shops, schools, offices or the family than in hospitals or sanatoriums. There is more need, therefore, of effecting a rigorous control through prophylaxis, the methods of which are well known, than to push disinfection of places, furniture and books to the extreme. These results did not go unchallenged. Sergeant cited two cases in which minor operations on the nasopharynx led to a tuberculous evolution and cases of nurses and students in which 5 per cent carried bacilli on the mucous membrane of the nasopharynx, and that under strictly prophylactic conditions. In one of the preceding sessions Weill-Hallé had reported that in a group of 889 student nurses of the school of puericulture of the Faculty of Medicine of Paris 77.2 per cent were tuberculin positive on entrance. Among these 686 students with a positive reaction, only five had manifested tuberculous lesions

in the course of their training. On the other hand, in the 203 students who had become tuberculin positive after entrance, twenty cases of tuberculosis were found. The coexistence of a previous positive reaction and a satisfactory state of health are consequently a guaranty of resistance. Vaccination should include all those who are thrown together with possible germ carriers, such as health personnel, apprentices and soldiers.

BERLIN

(From Our Regular Correspondent)

Feb. 2, 1940.

No Socialization of the Profession Planned

The new plan for paying physicians (*THE JOURNAL*, January 20, p. 267) has repeatedly provoked fears lest the government intended to socialize the profession. Now Dr. Grote, leader of the sick fund association, announces that the measures will apply only for the duration of the war and will not to be continued when the war is over. It is the intention of the health leader of the reich, he says, to maintain the medical profession as a liberal profession.

A New Institute of Biophysics

The Kaiser Wilhelm society for scientific research has been increased by the addition of a new institute of biophysics, constructed in Frankfurt on the Main with the extensive support of the city and the cooperation of the university. The building contains twenty research laboratories. There is here the first laboratory for the diagnosis of radium-intoxicated persons, that is, occupational diseases like those of miners and employees of radium factories. The principal tasks of the institute are the investigation of the biophysical problems of the effects of roentgen and radium rays on the tissues, the problems of the medical and the technical use of light, the effects of electric waves and of radioactive substances, and the study of idioradiation of living organisms, especially of the hypothetical rays of cell division. The new institute will be under the direction of Professor Rajewski.

Society for the Study of Nature

The trend in Germany toward the study of nature as a norm of living and of therapeutics has been reported previously. It originated as a pet notion with Dr. Wagner, the deceased leader of physicians for the reich. Dr. Conti, his successor, has organized a scientific society for the study of nature as a basis of living and healing. "Its purpose is to promote the scientific research of natural therapeutics to the fullest extent and the study of living according to nature. The results of this scientific inquiry are to be applied to the promotion of the health and efficiency of the people and to the treatment of the sick." Dr. E. G. Schenk, head physician of the hospital München-Schwabing, was appointed its director. He had previously worked out the program for the newly created society. The organ of the society will bear the name "Hippocrates."

BUCHAREST

(From Our Regular Correspondent)

Feb. 19, 1940.

Outbreak of Influenza

During the first quarter of 1939 a great influenza epidemic occurred in Cluj, the capital of Transylvania. The number of patients admitted to the university clinic has been enormous. Drs. Moga and Radu review their experiences in the *Clujul medical*. They state that influenzal infections may produce simultaneously cardiac and renal lesions, which are manifested in the form of a cardiorenal syndrome. When the picture is dominated from the onset by the cardiorenal symptoms, this particular form can be spoken of as "cardiorenal" grip. A differential diagnosis has to be established as against chronic nephritis and other disorders of purely cardiac or renal nature

the prognosis and treatment of which is quite different. The evolution of the cardiorenal form of influenza is quite benign, although in the initial stage the symptoms may be of a rather severe nature.

Air Raid Precautions in Rumania

In all towns and cities, regular courses on air raid precautions are being held. Attendance at these lectures is compulsory for everybody between the ages of 16 and 60. The first lecture teaches people how to carry out an effective black out. They are taught how to make close fitting blinds on windows. Ventilating gratings in bathrooms and lavatories need screening. The next lectures teach how to prepare refuge rooms. In Rumania the Anderson steel shelters cannot come into general use owing to their high cost. Complete instructions are given on how to prepare shelters. Another lecture shows what to do about incendiary bombs. The police require all house owners to provide in the attic of their houses a cubic meter of sand and a bucket, shovel and scoop. Demonstrations are given as to how to use gas masks and how to give first aid in gas poisoning. In every shelter, first aid kits have to be in readiness. Every attendant at these lectures gets a little book in which the day of attendance is recorded. Those who unjustifiedly miss lectures are fined.

Puericultural Centers

M. Marinescu, minister of public health affairs, has established 720 puericultural centers in the kingdom to combat the high infant mortality. In these centers village, parish and district physicians hold a clinic twice a week. During the hours of attendance not only the sick but also the healthy children are presented and the mothers are given advice as to the hygienic education of their children. To accustom the public to these centers the minister has allowed to each center a sum for buying sugar, tapioca, soap and milk. In 1939, 633,160 consultations were given to the public. The minister has been so much pleased with the result that he resolved to erect 600 more centers. Besides the consultations, the physicians make several hundred thousand calls also at the homes of the patients. During the last year 5,348 canteens for indigent school children have been erected, where poor children receive breakfast and luncheon.

BUDAPEST

(From Our Regular Correspondent)

Jan. 21, 1940.

Infant Mortality in Hungary

Infant mortality reached 13.1 per cent in 1938, the lowest rate yet experienced. Preceding the World War, and also immediately after, it wavered around 20 per cent. Still better than the national rate is that of the city of Budapest, where the infant mortality rate in the last year dwindled to 10.6 per cent. The total mortality rate in 1938 fell to 14.3. This rate is much more favorable than that of neighboring countries. The statistics show the favorable influence of urbanization. In 1937 the rate of deaths as to 100 live births in the rural districts was 14, in towns 12 and in the capital city 10.6. The mortality was lowest among the Evangelical and Jewish infants and the highest among the Greek Catholic and Greek orthodox infants.

The Treatment of Fainting of Auricular Origin

Prof. Robert Bárány, otologist and Nobel prize winner, who is of Hungarian origin, has studied a new symptomatic treatment of fainting. He combines quinine with atropine, and in this way it is possible to exert an elective action. Pajovics is used for the treatment of blood vessel spasms on account of its hypotensive action. A treatment generally lasts for a few weeks. Bárány used this method in twenty-three cases, of which seventeen were completely cured. In the majority of

cases recovery set in gradually. Several years has elapsed since recovery and no relapses have occurred. In two cases there was no improvement; one of these was an acoustic neuritis due to quinine taken in large doses for malaria; the other was a case of neurosyphilis.

The Spiritual Portrait of Semmelweis

The recently deceased Hungarian neurologist Prof. Charles Schaffer made a thorough study of the spiritual life of Semmelweis in order to clear up two questions: Of what spiritual type was this famous obstetrician of the past century? How did the mental aberration that appeared immediately prior to his death arise and is there any connection between it and his spiritual makeup? There were at Schaffer's disposal the notes of the late Hungarian professor Markusowsky, who lived under the same roof with Semmelweis, and also a series of photographs of Semmelweis made between his thirty-sixth and forty-sixth year of life. These photographs showed a round face, a straight nose, a high, convex skull and a not very protruding chin. They display also the signs of premature aging. His untimely death was caused by sepsis following a wound of his finger while performing a gynecologic operation.

In the latter weeks of his life he had to be placed in an insane asylum, where he died in August 1865. His brain was dissected by Professor Meinert, who besides some atrophy of the cerebral gyri observed turbidity of the meninges. From this Schaffer concluded that the insanity of Semmelweis can be related to the sepsis. Semmelweis was constantly hypersensitive. To corroborate this view, Schaffer quotes from letters addressed by Semmelweis in the defense of his theory to professors opposed to him. Those who did not share his conception he apostrophized as "murderers" and "medical Neros." His letters to his pupils and friends, however, show that Semmelweis was straightforward, outspoken, goodhearted and self sacrificing.

BUENOS AIRES

(From Our Regular Correspondent)

Feb. 3, 1940.

Leprosy in Argentina

A law governing the prophylaxis and treatment of leprosy was passed in 1926. The progress made can be determined from a bulletin of the division of venereal skin diseases of the federal public health service, issued by Dr. José J. Puente.

In the first census of lepers in Argentina in 1906, 724 lepers were counted; in October 1938 the number had increased to 3,905. According to the usual calculations of leprologists of other countries, the correct number is ascertained by multiplying by 2 or 2.5. This would bring the actual leprosy incidence in Argentina to between 9,000 and 10,000. The distribution of lepers over the country varies; 84 per cent are found in the so-called littoral, that is, the eastern provinces, 15 per cent in the central provinces and 1 per cent in the Cordilleras and Patagonia. In about 55 per cent of the cases open infectious lesions require isolation. In several large cities arrangements are made for treatment in the larger hospitals. The chief means of control, however, rests in the construction of leproseries, of which seven have either been built or are in planning. During 1934-1938, 6,800,000 Argentine pesos (about \$2,000,000) was made available for this purpose. The distribution of these leproseries is as follows: (1) in Posadas (Misiones) on 24 hectares of land (about 60 acres), dedicated in February 1938 with 140 beds; (2) in San Francisco de Chañar (Córdoba) on 981 hectares of land (2,433 acres), dedicated in March 1939 with 140 beds; (3) on the Isla de Cerrito (Chaco), an island in the upper Paraná river, dedicated in 1939 with 300 beds; (4) in General Rodríguez (Province Buenos Aires) on 275 hectares of land (680 acres), to be ready in the near future with 645 beds; (5) in Diamante (Province Entre Ríos), to be built on 123 hectares of land (300 acres)

with 260 beds; (6) in San Jerónimo (Province Santa Fé), where 240 hectares (590 acres) has been acquired to take care of 352 patients; (7) in Salta, to be erected. They are built on the so-called mixed hospital-colony plan; that is, they are equipped with all necessary hospital accessories and all the agricultural requirements for a colony. About four fifths of the patients request federal isolation because of indigence. The leproseries are planned to afford the patients some satisfaction in living. Progress in leproseries construction has been hindered by the determined opposition of communities among whom these colonies were to be built. In the northern province of Salta, a law was even passed prohibiting the construction of leproseries within the province (in some matters Argentina's provinces have the sovereignty of federal states). This law was revoked recently.

For the treatment of the lighter forms of leprosy, chaulmoogra oil is administered in preparations made by the bacteriologic and chemical institute of the federal public health service. These preparations are supplied on request to hospitals, physicians and patients without cost.

In Buenos Aires the home visiting of leprosy patients, in voluntary isolation in their own homes, has been instituted. This service is gradually to be extended to the whole country.

Personals

For the first time in the medical history of Argentina a woman has been appointed as associate professor at the faculty of Buenos Aires, namely, Dr. Maria Teresa Ferrari de Gaudino, previously connected with the obstetric clinics. She has studied in Europe and in the United States.

Prof. José Arce, professor of surgery and dean of the medical faculty of Buenos Aires, has bequeathed his entire property to the university. It is to bear the name of the Arce Foundation. Professor Arce and his wife will reserve the income of the estate during their lifetime.

The city council of Buenos Aires accepted a legacy of 1,100,000 Argentine pesos (about \$250,000) made by Juan M. Mouras and intended for the construction of a lying-in hospital. It will bear the name of the mother of the donor.

Dr. Miguel Sussini, president of the state department of public health for the last seven years, retired in May 1939. He contributed much to public health development in Argentina. On several occasions he represented Argentina in Pan-American conferences. He was a man of extensive learning and great energy and was highly esteemed. Prof. Juan J. Spangenberg, a well known internist, was named as his successor.

Marriages

EZRA H. WALKER, Sego, Utah, to Mrs. Emma Peterson Newell of Moab, Utah, Oct. 22, 1937, just recently announced.

WILLIAM McCANDLESS PETTY, Pittsburgh, to Miss Virginia Lee Thrower of Tampa, Fla., February 17.

MARSHALL JETHRO COLEMAN of Darlington, S. C., to Miss Mattie Ward of Effingham, February 16.

HERBERT H. MINTHORN, Longview, Wash., to Miss Anne Britain of Hinsdale, Ill., Dec. 30, 1939.

DWIGHT McIVER CURRIE, Baltimore, to Miss Suzanne Holloway of Carthage, N. C., January 27.

IRVINE SAUNDERS, Baltimore, to Miss Frances Lee Tiller of Lakeland, Fla., February 17.

CLARENCE BERNSTEIN, Chicago, to Miss Babette Friedmann of Philadelphia, March 12.

HAROLD H. ROTHENBLER to Miss Sunny J. Shelby, both of New York, February 14.

JOHN L. HARDY JR., Seattle, to Miss Marie Hayes of Portland, Ore., February 4.

IRVING GINSBURG, Chicago, to Miss Selma Mervis of Lima, Ohio, February 18.

Deaths

John Prentiss Lord ☉ Omaha; Rush Medical College Chicago, 1882; member of the House of Delegates of the American Medical Association in 1921 and in 1925, and chairman of the Section on Orthopedic Surgery, 1926-1927; in 1914 joined the faculty of the University of Nebraska College of Medicine as professor of orthopedics, in 1919 was made chairman of the department of orthopedic surgery and since 1932 professor emeritus of orthopedic surgery; professor of anatomy at the John A. Creighton Medical College in 1892 and professor of surgery from 1893 to 1913; member and past president of the Western Surgical Association; past president of the Nebraska State Medical Association, Medical Society of Missouri Valley and the Sioux Valley Medical Association; past president and secretary of the Omaha-Douglas Counties Medical Society; member of the Clinical Orthopedic Society and the American Academy of Orthopedic Surgeons; charter fellow, and since 1929 member of the board of governors of the American College of Surgeons; served during the World War; for many years on the staffs of St. Joseph's Hospital; Clarkson Hospital, Methodist Hospital and the Immanuel Hospital, Omaha; superintendent and chief surgeon of the Nebraska Orthopedic Hospital, Lincoln, from Oct. 1, 1905, to June 1, 1911, and chief surgeon from June 1, 1911, to Oct. 1, 1917; aged 79; died, March 3, of coronary thrombosis.

Dewitt Halsey Sherman ☉ Buffalo; University of Pennsylvania Department of Medicine, Philadelphia, 1890; University of Buffalo School of Medicine, 1891; in 1893 instructor in therapeutics, in 1898 adjunct professor of therapeutics, in 1909 associate professor of therapeutics and clinical professor of diseases of children, in 1912 professor of materia medica and clinical professor of diseases of children, in 1916 professor of therapeutics and pediatrics, in 1917 professor of pediatrics and head of the department of pediatrics and since 1929 professor of pediatrics emeritus and served in administrative capacity as a member of the university's administrative committee from 1912 to 1924 and the board of instruction from 1917 to 1920 at the University of Buffalo School of Medicine; member and formerly vice president of the American Pediatric Society; member of the American Academy of Pediatrics; past president of the Buffalo Academy of Medicine and the Erie County Medical Society; for many years regional consultant in pediatrics of the New York State Health Department; served in various capacities on the staffs of the Children's Hospital, Buffalo General Hospital and the Buffalo City Hospital; aged 75; died, February 1, of bronchopneumonia and aplastic anemia.

George Michael Fisher ☉ Utica, N. Y.; Albany (N. Y.) Medical College, 1892; member of the House of Delegates of the American Medical Association in 1923, 1927, 1928 and from 1934 to 1939; past president of the Medical Society of the State of New York, Oneida County Medical Society and the Oneida County Council on Tuberculosis and Public Health; member of the American Roentgen Ray Society and the American Academy of Dermatology and Syphilology; served in various capacities on the staffs of St. Luke's Hospital, Utica General Hospital, St. Elizabeth Hospital and Utica State Hospital; aged 71; died, February 25, in St. Luke's Hospital, Newburgh, of toxic nephritis.

William Emerson Preble ☉ Boston; Harvard Medical School, Boston, 1909; at one time instructor in clinical medicine at Tufts College Medical School and special lecturer in the department of hygiene at Wellesley College, formerly consultant to the Boston Dispensary, Somerville (Mass.) Hospital, Forsyth Dental Infirmary, Boston State Hospital, Elliot Community Hospital, Keene, N. H., Leominster (Mass.) Hospital, Community Hospital, Ayer, Mass., Peterborough (N. H.) Hospital, Rockingham Hospital, Bellows Falls, Vt., and Metropolitan State Hospital, Waltham, Mass.; aged 63; died, January 22, of hemorrhage due to gastric ulcer.

Arthur Charles Stokes ☉ Omaha; University of Nebraska College of Medicine, Omaha, 1899; professor of clinical surgery at his alma mater from 1904 to 1925 and since 1931 regent; member of the Western Surgical Association and the American Urological Association; fellow of the American College of Surgeons; served during the World War; formerly medical director of the Guarantee Mutual Life Insurance Company; aged 70; died, January 24, of coronary thrombosis.

John B. Dibble, Detroit; Detroit College of Medicine and Surgery, 1920; member of the Michigan State Medical Society; fellow of the American College of Surgeons; instructor in obstetrics and gynecology at the Wayne University College of

Medicine; on the staff of the Harper Hospital and the Flax-Crittenton Hospital; aged 45; died, February 8.

Daniel Mansfield Hoyt ☉ Bay Pines, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; on staff of the Veterans Administration Facility; served during World War; aged 66; died, January 27, in St. Petersburg, of acute coronary thrombosis.

Paul Eber Norman Greeley ☉ Waterman, Ill.; University of Michigan Homeopathic Medical School, Ann Arbor, 1891; Rush Medical College, Chicago, 1901; past president of the Kalb County Medical Society; medical director and owner of the East Side Hospital; aged 64; died, February 10, of coronary thrombosis.

Josephus Simmons Beard, Troy, Ala.; University of City of New York Medical Department, 1876; member of the Medical Association of the State of Alabama; past president of the Pike County Medical Society; co-owner of a hospital bearing his name; aged 87; died, February 8, of senility.

Edward Leander Pratt, Lewiston, Maine; Columbia University College of Physicians and Surgeons, New York, 1911; fellow of the American College of Surgeons; aged 54; on the staff of the Central Maine General Hospital, where he died, January 19, of coronary thrombosis.

Stanley Aaron Krebs, Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1911; member of the Medical Society of the State of Pennsylvania; served during the World War; on the staff of the Easton Hospital; aged 51; died, January 6, of heart disease.

Howard Mellor ☉ West Chester, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; past president of the Chester County Medical Society; on the staff of the Chester County Hospital; aged 74; died, January 2, of mitral stenosis.

Rudolf Kronfeld, Chicago; Medizinische Fakultät der Universität Wien, Austria, 1926; member of the Illinois State Medical Society; also a dentist; professor of dental pathology at the Dental School of Loyola University; aged 38; died, February 13.

James Folwell Wood, Mount Wolf, Pa.; Medico-Chirurgical College of Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; aged 60; died, Dec. 1, 1939, in the York (Pa.) Hospital of arteriosclerosis.

Alfred Ellsworth Owens, Princeton, Ill.; Chicago Medical College, 1883; member of the Illinois State Medical Society; on the staff of the Perry Memorial Hospital; aged 82; died, January 21, in Moline of chronic myocarditis.

James F. Haynie, Gulfport, Miss.; Memphis (Tenn.) Hospital Medical College, 1905; member of the Mississippi State Medical Association; aged 61; died, January 25, of carcinoma of the sigmoid and liver.

Daniel Bonaparte Cliffe, Franklin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1894; veteran of the Spanish-American and World wars; aged 67; died, January 2, of myocarditis.

James Miles Brooks, Jackson, Miss.; College of Physicians and Surgeons of Chicago, 1883; aged 82; died, January 9, of chronic myocarditis, hypertension and arteriosclerosis.

John Anderson Bryan, Tampa, Fla.; University of Georgia Medical Department, Augusta, 1891; aged 71; died, January 22, of arteriosclerosis and myelogenous leukemia.

Owen McKeon, St. Paul; Medical Department of Hamline University, Minneapolis, 1900; aged 68; died, January 4, of cardiac infarction and cerebral arteriosclerosis.

Oliver Clarkson McNary, Santa Monica, Calif.; Jefferson Medical College of Philadelphia, 1882; aged 90; died, January 23, of carcinoma of the colon.

Robert Claud Foster, Whipple, Ariz.; University of Arkansas School of Medicine, Little Rock, 1903; aged 57; died, January 5, in Los Angeles.

Parry Bernard Larimer, Belle Valley, Pa.; Jefferson Medical College of Philadelphia, 1905; aged 59; died, Dec. 1, 1939, of heart disease.

Benjamin J. Perry, Hayward, Calif.; Chicago Medical College, 1873; aged 91; died in January of cerebral thrombosis and arteriosclerosis.

Edwin P. French, Los Angeles; Michigan College of Medicine, Detroit, 1882; aged 83; died, January 19, of cerebral hemorrhage.

Bureau of Investigation

SOME FRAUDULENT "FEMALE REGULATORS"

S. S. Certified and Silver Seal Treatments

A concern doing business from Carthage and Joplin, Mo., under the names Silver Seal Company and Quikade Company, and their officers and agents as such, were debarred from the mails by a Post Office fraud order on Dec. 12, 1938. The moving spirit in the enterprise was a Maynard L. Durham, who advertised in magazines his "S. S. Certified Treatment" which he claimed "moved many stubborn, exceptional delays quickly." In a circular letter he described the stuff as "an ergotin compound . . . made from the prescription of our medical advisor," who also recommended in a letter to one inquirer "a special prescription for your pus tubes and bad discharge." Another letter advised: "For the pain part we have a special Silver Seal Pain Relief Tablet which has been especially prepared for women bothered with painful menstruation." Altogether there were three preparations, "S. S. Certified," "S. S. Certified Special" and "S. S. Certified Guaranteed." The promoter admitted that all three of them were made from the same formula, which was

Ergotin	1 gr.
Extract cotton root.....	1 gr.
Extract black hellebore.....	1 gr.
Aloes	1 gr.
Ferrous sulfate	1 gr.
Oil of savin.....	¼ min.

The Solicitor for the Post Office Department, in recommending the issuance of the fraud order, brought out the following illuminating facts: Maynard L. Durham had also been an advertising agent and had prepared and handled the propaganda of the F. B. Drug Company of Springfield, Mo., a concern against which the Post Office had issued a fraud order earlier in 1938. The latter concern had sold for delayed menstruation a nostrum identical with Durham's, both having been purchased from the wholesale drug concern, the Shores Company, Inc., of Cedar Rapids, Iowa. In spite of the fraud order against the F. B. Drug Company, Durham nevertheless continued to sell his product through the mails, representing it as the prescription of a regular physician. The Post Office memorandum, however, showed that the formula had been a stock prescription long before the physician in question ever employed it.

It may be added that on Aug. 17, 1937, the Federal Trade Commission announced that it had ordered the Silver Seal Company of Carthage, Mo., to cease making unwarranted claims for its "Silver Seal Treatments," apparently another name for the ones described above.

Evon and Murvel Tablets

From Springfield, Mo., one Floyd German operated as the Evon Company, conducting his business from a desk in the rear of a bungalow where he also ran a printing concern. German advertised and sold through the mails a number of preparations, apparently of varying strengths, for "delayed menstruation," including "Evons No. 1" and "Evons No. 2 (Murvel Super X)," "Murvel Special Compound Tablets," etc., and claimed, among other things, "Evon Treatments are the peak of perfection, possessing the very latest improvements in every way . . . can be taken without fear of bad after effects, perfectly safe, harmless . . ."

According to the memorandum from Hon. Vincent M. Miles, Solicitor for the Post Office Department, to the Postmaster General, recommending the issuance of a fraud order, the various tablets had the following composition:

EVON TABLETS NO. 1

Combination of Ext. of Cotton Root Bark ½ gr., Black Hellebore ½ gr., Ferrous Sulfate Exsiccated, Powdered Ginger and Aloes, Oils of Tansy, Savin and Pennyroyal Each 1-8 minim.

MURVEL SPECIAL COMPOUND TABLETS

Ergotin (Bonjean) 1 gr., Ext. Cotton-root bark 1 gr., Aloe 1 gr., Ferrous Sulfate, exsiccated 1 gr., Oil Savin q. s.

MURVEL SUPER "X" COMPOUND TABLETS

Combination of Ferrous Sulfate 1 gr., Aloes 1 gr., Ergotin 1 gr., P. E. Cotton Root 1 gr., P. E. Black Hellebore 1 gr., and Oil Savin q. s.

The expert medical testimony introduced at the hearing of this case showed that abnormal delay in menstruation may be due to any one of a number of conditions, such as pregnancy, inflammation of the pelvis or dysfunction of the anterior pituitary gland and ovaries; and this last-named disorder may in turn be due to disorders of the glands themselves, including cysts and tumors, or to general debilitating diseases or conditions of the body, such as tuberculosis, toxemia, morphinism, anemia, diabetes, alcoholism, hypo-adrenism, hypothyroidism and cachexia, or general ill health and malnutrition. This testimony also brought out the fact that pelvic disorders which may cause delayed menstruation include malformations, malposition of the womb, gonorrhea and cancer; and that, regardless of the origin of delayed menstruation it is obvious that no one treatment, even from scientific sources, could correct all cases of this disorder, or even a considerable percentage of them.

The Solicitor for the Post Office Department found the business to be a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and a fraud order was issued against it on Dec. 28, 1938.

D. D. Strength Favorite Regulators and Two Other C. O. Myers "Cures"

From Kansas City, Mo., a C. O. Myers operated, under the trade names Myco Company and Myces Company, a mail order business selling nostrums for delayed menstruation, hemorrhoids and premature ejaculation. The enterprise was said to have been started in 1900 in Atchison, Kan., and moved in 1917 to Kansas City, becoming a mail order business around 1933.

Suckers were obtained through advertisements in various publications and through circulars sent out by mail. The latter played up "D. D.

Strength Favorite Regulators" for "Irregular, Suppressed, Overdue or Delayed Monthly Periods from unnatural causes or from irregular, delayed, painful or profuse flow . . ."

Also "for extra stubborn cases Our Duo-Regulators are well recommended by many ladies who used them with good results." The first-named tablets were reported by government chemists to consist of:

Extract cotton root.....	1 gr.
Ferrous sulfate exsic.....	1 gr.
Aloe	1 gr.
Ergotin bonjean P. T.....	1 gr.
Ext. black hellebore.....	1 gr.
Oil savin	¼ gr.

LADIES—When delayed, use Favorite Monthly Regulators. Get quick relief; limited time saving offer, regular \$2 double strength, with valuable directions, only \$1.33 Duo-Regulators for extra stubborn cases only \$2. Trial size, 25c. Myco, Dept. 207, 3235 S. Benton, Kansas City, Mo.

Typical Myers "come-on."

In his recommendation for a fraud order, Hon. Calvin W. Hassell, Acting Solicitor for the Post Office Department, pointed out that medical evidence before him showed that the control of menstruation lies in the endocrine glandular system and that there are no known drugs which, taken by mouth, will produce the ovulation necessary to menstruation if endocrine dysfunction is present. Hence the tablets in question would be worthless as a treatment for amenorrhea.

Myers' alleged pile cure known as the "Triple Treatment" was claimed to be "a complete pile relief, because it consists of tablets for internal use and having direct action at the rectum, a healing pain relieving salve for internal and external use and laxative wafers for the relief of constipation, a big cause of piles." The government chemists reported on the treatment as follows:

Triapila consists essentially of oxyquinoline sulfate and ane-thesin incorporated in a base of petrolatum with ephedrine.

Triapila Tablets: Unable to detect anything other than milk sugar, starch and acid soluble material.

Lax-A-Wafers: Consist essentially of phenolphthalein.

Mr. Hassell's memorandum reported that medical evidence showed that these preparations did not constitute an effective remedy or cure for any form of piles, since they could not remove or beneficially affect all the causative factors. It was

further shown that though Myers, the promoter, was a pharmacist, he had had no medical training and that no physician or chemist was engaged or consulted in the conduct of the business.

Myers' treatment for premature ejaculation was "Pro-Long-Zit," described in advertising as "Man's most personal friend, it helps retard and control, it Thrills." According to the government chemists it consisted essentially of quinine urea hydrochloride incorporated in a cold cream base with 14.47 per cent water and perfume. Mr. Hassell showed he had medical evidence to the effect that while this preparation did contain a local anesthetic, mere dulling or numbing of the sensation in the glans penis could have no possible beneficial effect on inflammations of the internal genital organs, which are among the causes of premature ejaculation.

Because of the various misrepresentations made for Myers' products, a fraud order was issued Sept. 20, 1938, against the man, also covering the names of his Myco Company and Myces Company. It may be of interest that back in September 1933 another government agency, the Federal Trade Commission, announced that it had prevailed on C. O. Myers, trading as the Myco Company of Kansas City, to sign a stipulation promising to cease and desist from making "false or misleading" representations for his "Favorite Regulator"; and from "describing, labeling, branding or designating same either inferentially or otherwise as an effective contraceptive or abortifacient."

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bloodline.—American Drug Syndicate, American Proprietary Syndicate (or Co.), Malden, Mass., and Bloodline Co., Boston. Composition: Chiefly alcohol (22.1 per cent by volume), sugar and water, with a small amount of tartaric acid and a trace of an antimony compound. Fraudulently represented as an effective blood tonic.—[N. J. 30399; June 1939.]

Cre-O-Tol.—American Drug Syndicate, and American Proprietary Syndicate (or Co.), Malden, Mass. Composition: Soap, water, carbolic acid and neutral oils of coal tar. Fraudulently represented as a remedy for itching feet, swellings, cuts, burns, wounds, sore throat and inflammations.—[N. J. 30399; June 1939.]

Hy-Lo-Ex.—Medway Laboratories, Inc., West Medway, Mass. Composition: Essentially sodium biphosphate, sugar, water and oil of lemon. For chills, fever, pneumonia, asthma and some other disorders. Fraudulently represented as an effective blood tonic.—[N. J. 30394; June 1939.]

Koch's (Dr.) Camph-O-Lin.—Koch Products Co., Winona, Minn. Composition: Essentially turpentine, water and small amounts of camphor, soap, ammonia and ammonium chloride. Fraudulently represented as a cure for neuralgia, bronchitis, simple sore throat, lumbago, earache, aching feet and various congestions.—[N. J. 30601; November 1939.]

Koch's (Dr.) Inhalo.—Koch Products Co., Winona, Minn. Composition: Essentially volatile oils including eucalyptal and menthol (32.5 per cent by volume), alcohol (53.4 per cent by volume) and water. Misbranded because alcohol content is not declared on label and because product is fraudulently represented to prevent and relieve nose and throat discomforts.—[N. J. 30601; November 1939.]

Koch's (Dr.) Stick Salve.—Koch Products Co., Winona, Minn. Composition: Essentially a small amount of zinc oxide in a base containing rosin and beeswax. Fraudulently represented as a cure for cuts, sores, rheumatic and neuralgic pain, and backache.—[N. J. 30601; November 1939.]

Must-a-rub.—American Proprietary Syndicate, American Drug Sales Co. and New England Laboratory Co., Malden, Mass. Composition: Ointment consisting of petrolatum, paraffin, a trace of an iodine compound and essential oils including mustard, wintergreen and camphor. Fraudulently represented as a remedy for rheumatism, pleurisy, croup and some other things.—[N. J. 30396; June 1939.]

Prunitone Liver Pills.—American Proprietary Syndicate and American Drug Sales Co., Malden, Mass., and Prunitone Laboratories, Boston. Composition: Sugar-coated pills containing aloes, podophyllum, phenolphthalein, strychnine and brucine. For impure blood, nervousness, and all diseases of the stomach, liver and kidneys. Fraudulent therapeutic claims.—[N. J. 30399; June 1939.]

Strasphene.—Emdee Research Laboratories, Oakland, Calif. Composition: Acetphenetidin found, though presence and amount of this drug were not stated on the trade package as required by law. Hence the product was declared misbranded.—[N. J. 30026; May 1939.]

Correspondence

SENSITIVITY TO KARAYA GUM

To the Editor:—In connection with a recent report of cases of intestinal irritation from the use of karaya gum, I would say that I recently saw a patient who suddenly began to have three severe attacks of migraine in a week. When it was found that these attacks of headache started when she began to use a gummy laxative, this use was stopped and that was the end of the headaches.

WALTER C. ALVAREZ, M.D., Rochester, Minn.

ASPIRATION PNEUMONIA

To the Editor:—The recent article "Aspiration Pneumonia: An Obstetric Hazard," by Dr. Charles H. Hall (THE JOURNAL, March 2, p. 728) brings an important problem to a focus.

In the series reported no attempt appears to have been made to practice laryngoscopy and endotracheal suction. A recent experience with this technic suggests its value (Flagg, P. Drowning in the Operating Room, *New York M. Week* 19 [Feb. 3] 1940). Dr. E. M. Hawks has suggested that the lithotomy position, by causing increased intra-abdominal pressure, stomach being compressed between the fundus and the diaphragm, increases the likelihood of regurgitation of gastric contents. Intra-abdominal manipulation, in which the operator's hand is swept over the fundus of the uterus, may also cause pressure against the stomach.

It is obviously not practical to wash out the stomach of every obstetric patient about to be anesthetized. In the case that I reported the usual preoperative care was given, with the starvation commonly instituted preparatory for major surgery, and yet large quantities of fluid had collected in the stomach.

The author states that it is the opinion of a nose and throat associate that it is not possible to give enough barbiturate to abolish the gag reflex. While this is very likely true as an isolated fact, the addition of a small degree of general anesthesia or, what is more frequent, the addition of anoxia will promptly subdue the glottic reflex, permitting unembarrassed aspiration.

There is no doubt that continuous suction should be available wherever unconscious patients are cared for. Apparatus is not enough; a test should indicate at least 15 pounds suction, instantly available. Premedication reduces the cough reflex and increases the ease of aspiration as well as the difficulty of expulsion of aspirated material.

Cough, not deep respiration, should be induced. Cough is encouraged by stopping the anesthetic and stimulating the pharyngeal reflexes. Aspiration is increased by carbon dioxide. Face masks fastened to the patient often result in the loss of tactile contact by the anesthetist's hand with the patient's throat and jaws, and swallowing and retching movements may therefore be missed.

PALUEL J. FLAGG, M.D., New York.

Director of Activities of the Society for the Prevention of Asphyxial Death, Inc.

DELAYED CUTANEOUS REACTION TO THE INTRADERMAL INJECTION OF BRUCCELLERGEN

To the Editor:—In the February 10 issue of THE JOURNAL, Drs. L. E. January and J. A. Greene reported an interesting instance of delayed cutaneous reaction to the intradermal injection of brucellergen. In their case four days elapsed before a reaction appeared at the site of injection.

Two years ago, in association with Dr. Russell L. Hays, I had occasion to review all the cases of brucellosis diagnosed at the Cleveland Clinic between August 1927 and March 1929. In this period there were 126 cases, which in this institution

meant that approximately one case out of every 1,000 new cases was a case of undulant fever.

In 63 per cent, or seventy-nine, of our cases intradermal injections of 0.05 cc. of Jensen-Salsbery undulant fever vaccine were given intradermally. We considered six of these cases, or 7.5 per cent, as presenting delayed positive reactions; that is, evidence of their positive character occurred after forty-eight hours. In four cases the tests were not found positive until the third day. In a fifth case no reaction occurred until the fourth day, and in another case the intracutaneous reaction did not occur until the sixth day. In two other cases not included in this series but seen in the last three weeks there were delayed intracutaneous reactions to the intradermal injection of brucellergen. In one instance no reaction occurred until the fifth day and in the second instance no reaction occurred until the sixth day.

WILBUR E. FLANNERY, M.D., Cleveland.

SENSITIVITY TO ESTROGENIC SUBSTANCE IN OIL

To the Editor:—In a recent issue (Dec. 2, 1939, p. 2055), Drs. L. A. Levison and J. J. Harrison reported a case of sensitivity to estrogenic substance. I have encountered a somewhat similar case, but the condition was manifested by shock rather than by dermatitis.

Mrs. J. H., a housewife aged 51, was first seen by me on July 9, 1939, at which time she was suffering from extreme nervousness, sleeplessness, gastric upsets, excessive salivation, diarrhea, inability to concentrate and lapses of memory.

She had had the usual childhood diseases; a complete right and partial left oophorectomy was done in 1930; complaints somewhat similar to those mentioned had been present for the past eight years. She had spent eight months in a sanatorium for a "nervous breakdown." She had been taking daily 9 grains (0.6 Gm.) of sodium amytal and 90 drops of tincture of belladonna. The patient had one normal delivery with a living child but no other pregnancy. She has had a very difficult climacteric without flow since 1930.

The patient was well developed and well nourished.

She was advised that the condition was due to lack of hormone. Treatment was refused, however, since previous attendants had used this therapy and the patient had gone into shock, requiring epinephrine to recover. Despite this, 600 units of Abbott's estrone was given intramuscularly. Almost immediately the patient became cyanotic; her pulse was extremely rapid and faint. As she was approaching a comatose state, 10 minims (0.6 cc.) of epinephrine was given. After thirty minutes the patient was apparently over the shock.

On July 15, 10 mg. of estradiol three times a day was started. After two days there were no adverse effects. On July 17, skin tests were made with a small amount of each of the following products: estrone-Abbott 2,000 international units in 1 cc. of oil; theelin-Parke, Davis & Co., same concentration; product of U. S. Standard Products Company, same concentration; estrolin-Lakeside Laboratories, Inc., and Mallard's hormogen. All but one gave a definite reaction. This was the product of the U. S. Standard Products Company.

On July 19, 1,000 international units of estrogenic substance was given, the U. S. Standard Products Company brand being used, and there were no adverse reactions. On July 20, 2,000 international units of the same was administered without adverse reactions. On July 23 the patient consumed a salad with peanuts in it, resulting in an extreme gastrointestinal upset. From then on peanuts were eliminated from her diet.

Since the patient made a rapid and complete recovery, I concluded that she was not sensitive to the hormone proper but to the oil vehicle. I inquired, therefore, from the various detail men about the oil used in their respective products, and this is the list as given: Abbott Laboratories, sesame oil; Parke,

Davis & Co., peanut oil; Mallards, peanut oil; Lakeside Laboratories, sesame oil, and U. S. Standard Products Company, almond oil.

At present the patient is well and is carrying on all her usual activities, but she requires about 2,000 units of estrogenic substance every four weeks.

EARL S. DAVIS, M.D., Belvidere, Ill.

DEATH FROM AIR EMBOLISM AFTER PERIRENAL INSUFFLATION

To the Editor:—In the February 24 issue of THE JOURNAL appeared an article on "Death from Air Embolism Following Perirenal Insufflation" by Dr. Henry J. Weyrauch Jr. In my experience, which consists of eighty perirenal insufflations, there was never any untoward complication.

Granting that the needle is passed properly and that no blood is aspirated, I believe that the most important safeguard in the procedure of insufflation is dependent on the type of delivery system employed. I have never used any other system than a two bottle pneumothorax machine which delivers air under gravity pressure at about an 8 inch level. With this type of system the gas flows under relatively low pressure, at least a pressure low enough so that if the needle should be within the kidney substance or within abdominal musculature there will be no flow of the gas. If the needle is within the perirenal space, gas will "bubble" through the inverted infusion drip apparatus. The easy bubbling of gas has been an excellent guide and indicates that one is in the proper plane. When equilibrium is established between the pressure of gas in the perirenal space and the 8 inch pressure from the machine, gas no longer flows. Respiratory excursions are transmitted to the "bubble chamber" at this point. The amount of gas instilled varies in individuals and has been anywhere from 250 to 900 cc. For a description of the apparatus I use, I refer the reader to my article in THE JOURNAL, Oct. 23, 1937.

Despite the fact that the statement is made in Dr. Weyrauch's article that "no excessive force was exerted," there is no way of judging how much force is exerted by thumb or hand pressure, whether a syringe or bulb is used, unless connection is made with a manometric machine. In addition, with hand pressure fluctuations in force can easily take place. Thumb or hand pressure may force air into any tissue plane. Another consideration is that the needle may be displaced easily from its proper place by a heavy syringe or by a valve arrangement attached directly to the needle.

I have spoken with several physicians who have reported fatalities, and in each case the thumb or hand pressure, syringe or bulb method was employed to deliver the gas into the perirenal space.

I consider it essential that intravenous pyelography be performed before insufflation is contemplated, since the pyelographic plates will give an idea as to the size, position and outline of the kidney. It is conceivable, when a kidney is rotated, that the vascular renal pedicle might face in the direction of the site of the needle puncture. Also in cases in which large tumors are present the needle might make its entrance directly into the tumor. It seems to me that in figure 2 of Dr. Weyrauch's article the air does not appear localized to the perirenal space, although the reproduced picture might not show as good visualization as the original x-ray film.

Ordinarily there are practically no large vessels in normal perirenal fat. There may be numerous capillaries, but I do not see how a large caliber spinal needle could make its entrance into one of these tiny capillary vessels. It is also true that in cases of renal tumors the vessels in the perirenal space may be huge. Perirenal insufflation is not indicated in cases of renal tumors, since pyelographic studies should be sufficient to make a diagnosis.

W. H. MENCHER, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DERMATITIS FROM CHLORINE OR LAUNDERING SOAPS

To the Editor:—At this institution where tuberculosis patients are treated we are having among the patients as well as the employees an irritation of the skin. This irritation manifests itself by a dryness and redness of the skin not confined to any particular part of the body. There are patients that seem to be affected mainly on the back and the backs of the arms; some on the body and face also. Subjectively there is an accompanying itching and burning, usually after a bath. By using olive oil rubbed on the skin following the bath the irritation, burning and dryness are lessened. A lotion also gives some relief. The water supply used here is from an artificial lake at an elevation of about 800 feet. There are a lot of oak trees around the lake, leaves from which blow and fall in the lake in large numbers. There are also some pine trees, needles from which fall in the lake. Hydrated lime is used in quantities to keep the pH at 8.4, some 10 pounds daily to about 90,000 gallons of water. Alum is used in quantities of about 3 quarts to the same amount of water daily. Chlorinated lime, 0.15 parts per million, is used. Could you please suggest the part of the chemicals in the water that may be the cause of the cutaneous irritation, presuming that it is the source? Also could you tell the best method of counteracting this disagreeable effect of the water on the skin? It may help also to know about the soaps used in the laundry. For colored clothes a low titer soap, 130 to 140 degrees is used. The clothes are soured with antiseptic of low titer as the neutralizing agent. For white clothes and sheets the wash is started with a quick brake and alkali and then the high titer soap is used as needed. Rustex is used to sour for neutralizing white clothes.

M.D., Oklahoma.

ANSWER.—The fact that not all the patients and employees are affected shows that the causative agent is not a primary cutaneous irritant but rather that the patients are hypersensitive to it. The fact that there is only dryness and redness of the skin shows that the causative agent is not an active allergen (which would be likely to cause papules and vesicles) but rather a weak fat solvent, a keratolytic agent or a mild dehydrator. The fact that patients are affected on the back and on the back of the arms seems to point to bed clothes or underclothes as containing the irritant. This, however, will not account for employees having dermatitis on the face. Perhaps both the water and the laundering methods are at fault.

If it is presumed that the cutaneous irritation is caused by water, then it is most likely that the alkalinity and the chlorine content of the water are at fault, the alkali being the fat solvent and keratolytic agent and the chlorine acting as an irritant to the skin. While a pH of 8.4 is not sufficient to irritate a normal skin, it may be sufficient to cause the kind of dermatitis described on the skin of alkali-sensitive individuals or on people with dry skins which cannot replace the fat taken out by the alkali. The statement that 1,500 mg. parts of chlorinated lime per million is used is not quite clear. If 1,500 mg. of chlorinated lime per liter of water is used as a stock solution to add to the water in suitable amounts, it may be possible that the chlorine content of the water is not too high. If, however, there is 1,500 mg. of chlorinated lime per liter of water actually used, the chlorine content is entirely too high and may be the cause of the dermatitis. The usual amount of chlorine recommended for use in water varies from one part of available chlorine to 500,000 for heavily contaminated water to one part to 3 million. Anything in excess of one part of chlorinated lime to 200,000 parts of water is apt to cause trouble.

If the trouble is due to the method of washing clothes, it is due either to improper neutralization after souring, that is either too much or too little of the Rustex being used, or some of the patients may be hypersensitive to one or more of the chemicals in Rustex. Soures such as this may contain such irritants as oxalic acid and the fluorides.

The chlorine content of the water should be kept within the allowable limits, from 1:500,000 to 1:3,000,000 and the pH as close to 7.0 as possible.

In order to eliminate the laundering methods as a possible cause of dermatitis, a sour should be used consisting of only a solution of acetic acid, and after souring the clothes be thoroughly rinsed in water having a pH as near to 7.0 as possible and a low chlorine content in order to remove excess of souring agent or alkali. This will preclude leaving any irritant on the laundered clothes.

BASEMENT MEMBRANE BENEATH FETAL VILLI

To the Editor:—In studying the pathology of apparently idiopathic abortions, fetal deaths and, later, monstrosities, I observed a definite basement membrane beneath the trophoblastic layer of the fetal villi. Generally this membrane, by ordinary stains, is invisible, but it becomes prominent changes in a considerable number of these conditions. I view it as a membrane histologically, functionally and pathologically related to the membrane beneath the kidney glomerular epithelium, described by Bell with his azocarmine stain. I am presenting a paper on these studies and am anxious to include and demonstrate this basement membrane. I have studied carefully all available references to the histologic exposition of this membrane without success. Has it ever been described and in what connection? Has it ever been described as associated with fetal pathologic change?

W. E. B. Hall, M.D., Denver

ANSWER.—There are no references in the literature to the presence of a membrane between the trophoblast and the connective tissue of the villus core. The membrane in the glomerulus between the epithelium and the vascular endothelium which Bell describes becomes more evident in the presence of degenerative changes in the glomerulus such as occur in eclampsia and lipoid nephrosis. Villi undergo tremendous changes during their life cycle. In early villi the trophoblast consists of a layer of discrete Langhans cells next to the connective tissue core and an outside layer of active syncytium. As the pregnancy progresses these two distinct layers become less prominent, and in the last trimester of pregnancy the Langhans layer cannot be demonstrated. Just what occurs to this layer is not known. It is possible that it completely disappears. In late pregnancy the epithelial covering of the villi consists of a thick layer of syncytium in which only nuclei and little cytoplasm are visible. It may be possible that the membrane described appears as a result of these changes in the trophoblast. To determine this point, villi at various stages of normal pregnancy should be studied carefully. In the event that this structure cannot be demonstrated at any period of normal gestation, its presence under pathologic conditions may be of significance. It is possible that a membrane can be demonstrated in the normal villus which becomes more evident in pathologic conditions.

DISTRIBUTION OF MALARIAL PARASITES—EFFECT OF ATABRINE

To the Editor:—To what extent does the malaria parasite affect the endothelial cells of the capillaries? Does it sporulate in these as well as in the red blood cells? What is the effect of atabrine on the malaria parasite? Does it penetrate the cell that harbors the parasite or does it simply attack the organism free in the blood stream? Is the prolonged use of atabrine apt to produce malignant changes in the bladder, as do other aniline dyes?

Edwin A. Harris, M.D., Kano, Nigeria.

ANSWER.—Only one investigator (Raffaele, 1937) has reported the identification of human malaria plasmodia in the reticulo-endothelial cells of the body. The material was obtained from a sternal puncture of two patients, one suffering from tertian malaria and one from estivo-autumnal infection. However, experimental work on bird malaria indicates that all the cells of the reticulo-endothelial system, including the endothelial lining of the capillaries, are attacked and invaded by the avian malaria plasmodia, even before the erythrocytes are invaded. In avian malaria, organisms in the stages described as parasites of the endothelium are nonpigmented schizonts. With experimentally infected birds known to have the infection for several days and then fed doses of atabrine, Kikuth (1938) found that death occurred in the treated animals as in the controls. On immediate postmortem examination unaltered plasmodia were demonstrated in the cells of the reticulo-endothelial system of the brain, lungs, liver, spleen and kidneys, although the plasmodia in the erythrocytes showed changes characteristic of atabrine therapy, i. e. loss of pigment, granulation and vacuolation. If these observations are applicable to malaria in man, it may be concluded that a reservoir of infection is first built up in the cells of the reticulo-endothelial system, that in these cells schizogony occurs, that this reservoir serves as a source of infection for the first invasion of the erythrocytes, and that atabrine, like quinine, attacks the free merozoites and the erythrocyte-inhabiting schizonts but is essentially innocuous to the plasmodia within the reticulo-endothelial cells.

Atabrine, when administered by mouth, is excreted mostly in the feces, unless it is prescribed over long periods in full therapeutic doses. Atabrine mussonate, for intravenous or intramuscular injection, should not be administered more than two or three times. Thus, within the limits of recommended dosage it is improbable that atabrine should produce malignant changes of the bladder.

AMINO ACIDS FOR NUTRITION

To the Editor:—Who has been doing recent work on intravenous injections of amino acids for the maintenance of nutrition? I should also like to know who manufactures this preparation and where I can secure some.

James J. Waring, M.D., Denver.

ANSWER.—The use of amino acids or hydrolysates of protein or the maintenance of nutrition recently has received the attention of investigators, but from information available it would seem that the technic still is in the experimental stage. In the *Journal of Pediatrics* for October 1939 appeared an article on "Nitrogen Metabolism During the Oral and Parenteral Administration of the Amino Acids of Hydrolyzed Casein" by A. T. Shohl, A. M. Butler, K. D. Blackfan and Elsie MacLachlan of Harvard Medical School. These investigators used an enzymatic hydrolysate of casein prepared by Mead Johnson & Co. The solution contained no protein. The feeding of this preparation to infants as a sole source of nitrogen resulted in positive nitrogen balance in all cases. The material also was administered intravenously together with dextrose and sodium chloride and always produced positive nitrogen balances. The authors reported, however, that in most instances when the material was injected intravenously there were untoward reactions, chiefly a marked elevation of body temperature. The authors concluded conservatively that further study is required to identify and remove the cause of the febrile reactions which have limited the clinical utility of this form of intravenous nutrition.

PROBABLE CONGENITAL VASCULAR
ANOMALY OF LEG

To the Editor:—An unmarried Chinese woman aged 25, a former slave girl, is known to have had varicose veins of the left leg since 8 years of age; her prior history is unknown. The condition has always been severe, but during the last three years it has become unbearable. Examination revealed an excellent general physical condition, except for long-standing ozena. No tumor or mass was palpated in the abdomen or pelvis. The Kahn reaction has been negative three times. There is an almost continuous mass of dilated veins, both subcutaneous and superficial, in the left leg, laterally from 1 inch (2.5 cm.) below the iliac crest, posteriorly from the gluteal fold, and extending to the tips of the toes, except for interruption at the side and front of the knee. The veins have a maximum diameter of 0.5 cm., while the superficial veins are a fine network of venules. The greatest number of veins are noted along the lateral side of the thigh and in the popliteal region, the calf of the leg, the dorsum of the foot and the tips of the second and third toes. They are found also on the sole of the foot and the medial side of the thigh. A rosette of superficial veins is found just above Poupard's ligament. The circumferences of the midthigh and the midcalf of the affected leg are 1.6 times those of the other leg. The patient is more comfortable when wearing an elastic bandage up to the midthigh, but even with the bandage she suffers continuously from aching pain, especially in the lower part of the thigh. Two years ago an operation was done which consisted of the following procedure: 1. Horizontal incision was made halfway round the lateral part of the midthigh with tying and cutting of all vessels encountered. 2. Although the saphenous vein apparently was not enlarged, an attempt was made to tie it at the saphenous opening. Only a small vein was found in this location. The saphenous vein was either congenitally absent or atrophied. It was not overlooked. 3. A vertical incision 7 inches (18 cm.) long was made on the medial surface of the midthigh, and the veins were excised over an area 3 inches (8 cm.) broad. These operations seemed to have no effect for good or ill: Newly dilated veins soon appeared to take the place of those which had been excised. The following observations describe the patient's present condition: 1. When she is flat on her back, with the leg flexed on the abdomen, the veins empty readily. 2. With the leg kept raised a broad elastic bandage was applied just below the knee; the patient stood up, and the veins filled in one minute. 3. With the patient standing and veins distended, a bandage was applied below the knee; the patient was placed on her back with the leg raised, and the veins emptied in one minute. Tests 1 and 2 were repeated with the bandage on the midthigh, with the same results. We have no facilities for roentgen treatment of the veins. Any suggestions for performing further tests or treatment will be appreciated. I have been considering amputation through the midthigh.

M.D., China.

ANSWER.—The description of a progressive dilatation of superficial veins defying the course of the anatomically known tributaries of the saphenous system suggests a congenital vascular anomaly. In addition to the increased diameter of the affected limb one would like to know whether the leg is any longer and warmer than its fellow. The blood in these venous dilatations is often more highly oxygenated than blood taken from a superficial vein in the other leg. This can be clinically detected by a brighter red color matched against blood from the other side. Such congenital vascular anomalies usually appear early in childhood and are sometimes associated with a cutaneous birthmark; they may also occur in conjunction with congenital abnormalities of the heart and great vessels. Some of these anomalies are virtually inoperable in adult life, as the vascular dilatations extend through the fascia into the muscles and may even invade the bone marrow. In such cases nothing short of an amputation helps. Other types, however, are amenable to improvement by

the proximal ligation of some of the larger feeders and the distal injection of these vessels with a sclerosing solution, such as sodium morrhuate or quinine and urethane. Such multiple ligations combined with injections may be carried out in a number of stages, and too much should not be done at once; otherwise the circulation of the whole limb might become impaired. If an ordinary x-ray machine is available, the extent of the lesion can be well visualized by placing a tourniquet at the root of the thigh and injecting 15 or 20 cc. of a radiopaque substance, such as sodium iodide, sodium bromide or any of the drugs that are used for intravenous pyelography.

BACILLUS PSEUDOTETANICUS

To the Editor:—In January I had a patient who was seriously ill; the blood culture was positive, and the organism resembled *Bacillus pestis*. We sent the culture to the state laboratory and after about three weeks' work they stated that the bacillus was not *B. pestis* and was not a pathogenic bacillus. We sent a culture to Tulane University and the Army and Navy Laboratory. The latter reported that the organism resembled *Bacillus pseudotetanicus* more than any other bacillus but did not classify it as pathogenic or nonpathogenic. We have a culture that could be reviewed by injection in animals and would appreciate your advice of any way that would aid in studying as well as classifying this bacillus. I would appreciate also any information on *B. pseudotetanicus* as I have been unable to locate it in the literature. I did find a reference to a description of this bacillus by W. W. Ford but have been unable to locate the literature. To whom could I send this culture for observation and study?

E. A. Heibner, M.D., St. Petersburg, Fla.

ANSWER.—The organism which was sent to laboratories for identification was reported by one laboratory to be nonpathogenic and by another to resemble *Bacillus pseudotetanicus*. This bacillus received its name from its resemblance to *Bacillus tetani* in morphology and spore formation but was distinguished from it by its aerobic development, its failure to liquefy gelatin and its lack of pathogenicity (Ford, William W.: *Studies on Aerobic Spore-Bearing Nonpathogenic Bacteria*, part 2, *J. Bact.* 1:520, 1916). It has received many different names. E. Neide (*Centralbl. f. Bakt.*, part 2, 12:337 and 350, 1904) called it *Bacillus spaericus* and listed seven other synonyms. The habitat of this bacterium appears to be widespread in nature. It has been found in wood, in the slime of pools and in the feces of man and is absent only from feces of infants fed exclusively on milk. With this widespread habitat the organism must certainly be considered as a likely contaminant in laboratory cultures. More significance could be given this bacterium if it was repeatedly found in subsequent blood cultures, provided external contamination was rigidly ruled out. Further information regarding the culture might be obtained from the National Institute of Health in Washington, D. C.

RECESSION OF GUMS FROM PYORRHEA

To the Editor:—A patient is unable to procure false teeth because of marked recession of the gums from pyorrhea. Would it be possible or feasible to build up the gums by transplanting bones from the ribs or the tibia? If such an operation has been described, I will appreciate a reference to it.

M.D., Alabama.

ANSWER.—Bone transplants demand scrupulous asepsis and, since aseptic surgical procedure inside the mouth is not possible, the matter of bone transplants to create a new alveolar ridge is quite out of the question. Cartilage transplants might be used because cartilage can be inserted in the mouth with satisfactory results. The usual method is to create a new vestibule by changing the position of the mucous membrane along the ridge. Such an operation will provide ample space for the seating of dentures in both the upper and the lower jaw and is much more likely to be successful than any attempts at bone or cartilage transplants.

BREAST MILK AND VITAMINS

To the Editor:—Does the breast milk contain sufficient vitamins (especially C and D) for the newborn baby? If so for how long a time?

C. E. Kemper, M.D., Viborg, S. D.

ANSWER.—Breast milk can furnish to the baby only such vitamins as are taken in the mother's food. It is therefore obvious that, unless the mother has a diet rich in vitamins C and D, she will not furnish an adequate supply of these vitamins to the baby. It is for this reason that it is strongly advisable to begin both orange juice and some form of vitamin D early in infancy. As it takes some time for either a vitamin C deficiency—that is, scurvy—or a vitamin D deficiency—that is, rickets—to develop it is impossible to say for how long a time the mother's milk alone would be adequate to protect a newborn baby. The only safe procedure is to take no chance and to supply these vitamins from earliest infancy on.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, March 23, page 1102.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, April 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: Basic Science. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. Medical (Regular). Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. Medical (Eclectic). Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, April 17. Written examination. San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N. St., Sacramento.

COLORADO: Denver, April 2-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

DELAWARE: Examination. Dover, July 9-11. Reciprocity. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: Basic Science. Washington, April 22-23. Medical. Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Basic Science. De Land, May 25. Sec., John F. Conn, De Land. Medical. Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, April 2. Dir., Bureau of Occupational Licenses, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, April 2-4. Acting Superintendent of Registration, Mr. Lucien A. Felt, 500 N. Dearborn St., Chicago.

INDIANA: Indianapolis, June 10. Sec., Board of Medical Registration and Examination, Dr. D. L. Owens, 301 State House, Indianapolis.

IOWA: Basic Science. Des Moines, April 9. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Building, Des Moines.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: Medical. Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homoeopathic. Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Basic Science. Minneapolis, April 2-3. Sec., Dr. J. Charnley McKinley, University of Minnesota, 126 Millard Hall, Minneapolis. Medical. Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.

MONTANA: Reciprocity. Helena, April 1. Examination. Helena, April 2-3. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: Basic Science. Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: Reciprocity with oral examination. Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 414 S. Third St., Grand Forks.

OHIO: Reciprocity. Columbus, April 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Basic Science. Oklahoma City, May 9. Medical. Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: Basic Science. Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, April 4-5. Sec., Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Booser, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 11-13. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 3014 Franklin Rd., Roanoke.

WISCONSIN: Basic Science. Madison, April 6. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. Medical. Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

WYOMING: June 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

New York Endorsement Report

Mr. Herbert J. Hamilton, chief, Bureau of Professional Examinations, reports 129 physicians licensed by endorsement from July 16 through November 21. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
College of Medical Evangelists.....	(1937), (1939, 2)	N. B. M. Ex.
Yale University School of Medicine (1934), (1935), (1936), (1937, 4), (1938, 5)		N. B. M. Ex.

Georgetown University School of Medicine.....	(1914)	Mar
(1935) New Jersey, (1937) Tennessee, (1935), (1936, 2), (1937), (1938, 8)		N. B. M. Ex.
Loyola Univ. School of Medicine.....	(1938)	New Jersey, (1939) N. B. M. Ex.
Northwestern University Medical School.....	(1939) N. B. M. Ex.	
Rush Medical College.....	(1937, 2)	N. B. M. Ex.
The School of Medicine of the Division of Biological Sciences.....	(1937) N. B. M. Ex.	
Indiana University School of Medicine.....	(1937)	
University of Louisville School of Medicine.....	(1933)	
Louisiana State University Medical Center.....	(1939) N. B. M. Ex.	
Johns Hopkins University School of Medicine (1933), (1939) N. B. M. Ex.		
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1933)	
(1938), (1939) Maryland		
Boston University School of Medicine.....	(1937) N. B. M. Ex.	
Harvard Medical School (1933, 2), (1934, 2), (1935, 2), (1936), (1938, 2)		N. B. M. Ex.
Tufts College Med. School (1930), (1936, 3), (1937), (1938) N. B. M. Ex.		
University of Michigan Medical School.....	(1904)	
(1937) New Jersey, (1936) N. B. M. Ex.		
Univ. of Minnesota Med. School (1927) N. B. M. Ex., (1939) N. B. M. Ex.		
St. Louis University School of Medicine.....	(1938, 2)	N. B. M. Ex.
Washington University School of Medicine.....	(1938) N. B. M. Ex.	
Albany Medical College.....	(1917)	(1938) N. B. M. Ex.
Columbia Univ. N. B. M. Ex.		
Cornell Univ. N. B. M. Ex.		
Long Island College of Medicine.....	(1936), (1937, 2)	N. B. M. Ex.
New York Med. College and Flower Hospital (1936), (1938) N. B. M. Ex.		
(1936), (1937, 9), (1938, 9) N. B. M. Ex.		
New York Univ. College of Medicine (1936) Ohio, (1938, 2)		N. B. M. Ex.
University of Buffalo School.....		
University of Rochester Sch.....		
Eclectic Medical College.....		
Ohio State University College.....		
University of Cincinnati College of Medicine.....	(1933)	
Western Reserve University School of Medicine.....	(1927)	
Hahnemann Med. College and Hospital of Philadelphia (1937) N. B. M. Ex.		
Jefferson Medical College of Philadelphia.....	(1917)	
(1937) N. B. M. Ex.		
University of Pennsylvania School of Medicine.....	(1906)	
University of Pittsburgh School of Medicine.....	(1923)	
University of Vermont College of Medicine.....	(1912)	
(1936), (1938) N. B. M. Ex.		
Medical College of Virginia.....	(1934), (1937), (1939)	
University of Virginia Department of Medicine.....	(1929) N. B. M. Ex.	
(1938) Virginia		
Marquette University School of Medicine.....	(1939)	
University of Toronto Faculty of Medicine.....	(1938) N. B. M. Ex.	
McGill University Faculty of Medicine.....	(1935), (1938) N. B. M. Ex.	
Université de Genève Faculté de Médecine.....	(1918)	

Utah July Examination

Dr. G. V. Billings, director, Department of Registration reports the written examination held at Salt Lake City, July 1939. The examination covered ten subjects and included 100 questions. Seventeen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.
University of Colorado School of Medicine.....	(1938)	81, 82
Northwestern University Medical School.....	(1937) 85,	(1939) 84, 85
Rush Medical College.....	(1938) 83, 82,	85, 86
The School of Medicine of the Division of Biological Sciences.....	(1938)	81, 82
University of Louisville School of Medicine.....	(1937)	81, 82
Creighton University School of Medicine.....	(1938)	81, 82
University of Oregon Medical School.....	(1937) 79,	(1938) 81, 82
University of Pennsylvania School of Medicine.....	(1938)	

Twenty-six physicians were licensed by reciprocity and 10 physicians were licensed by endorsement from May 5 through November 24. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.
University of California Medical Department.....	(1908)	
Loyola University School of Medicine.....	(1921)	
Northwestern University Medical School.....	(1934)	
Rush Medical College.....	(1936), (1937)	
The School of Medicine of the Division of Biological Sciences.....	(1936)	
University of Illinois College of Medicine.....	(1933)	
State University of Iowa College of Medicine.....	(1937)	
Univ. of Louisville School of Medicine (1934), (1937), (1938)		
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1935)	
Harvard Medical School.....	(1936)	
Creighton University School of Medicine.....	(1926), (1937)	
University of Nebraska College of Medicine.....	(1937), (1938)	
Cornell University Medical College.....	(1938)	
New York University College of Medicine.....	(1929)	
University of Oklahoma School of Medicine.....	(1937)	
Jefferson Med. College.....	(1924)	
University of Pennsylvania.....	(1929)	
(1933) Washington		
Dalhousie University.....	(1925)	

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Evangelists.....	(1931), (1932), (1933), (1934), (1935), (1936), (1937), (1938), (1939)	
New York University College of Medicine.....	(1931) N. B. M. Ex.	

Book Notices

The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds. By Perrin H. Long, M.D., Associate Professor of Medicine, The School of Medicine, The Johns Hopkins University, Baltimore, and Eleanor A. Bliss, Sc.D., Fellow in Medicine, The School of Medicine, The Johns Hopkins University. Cloth. Price, \$3.50. Pp. 319. New York: Macmillan Company, 1939.

This is an excellent volume on the subject of sulfanilamide and its related compounds. The authors are especially qualified to deal with this particular subject, and the facts they have gathered together in this volume are extremely useful to any one who is engaged in the clinical or experimental use of sulfanilamide. It has proved to be an excellent reference book, containing citations of practically all aspects of sulfanilamide and sulfapyridine therapy. There is full discussion of the clinical results as well as the various toxic manifestations from the use of these preparations. The mode of action of the drug is discussed in full, and the use of sulfanilamide in all the conditions for which it had been employed at the time the book was published is adequately detailed. The volume contains a complete index of authors, as well as a satisfactory subject index. The book is deserving of its popularity, both as a textbook and as a reference work, and the authors are to be congratulated on the thoroughness with which they have dealt with this new group of therapeutic substances.

Anatomical Adjustive Technic. By Homer G. Beatty, D.C., Ph.C., M.C., President, University of Natural Healing Arts, Denver. Cloth. Price, \$8. Pp. 334, with 132 illustrations. Denver, Colorado: The Author, 1939.

This weird thesis opens with the following definition of chiropractic:

Chiropractic is that branch of the Healing Arts which deals with the removal of interference with the transmission of Life Force by a process of relating disrelated structures by hand with the dynamic adjustive thrust, and includes the right and duty of using sanitary, hygienic and palliative measures incident thereto.

In view of this involved and practically meaningless definition, it is not surprising to find the following:

Infantile paralysis is caused by a fall or by injury to the pelvis, especially the sacrum, which instigates an inflammation of the spinal cord, resulting in a process called infantile paralysis.

It is not uncommon to find comparisons between the human body and such mechanical contrivances as the automobile. There are those who are fully qualified to make such comparisons, and it has been exceedingly well done in a series of articles which have appeared in *Hygeia*. It is interesting to note, therefore, that this author states:

Every machine is operated according to some plan, whether it be an automobile or a human body. The only form of interference with, or obstruction to, the completion of the machine plan comes about through structural distortion, or through improper quantity or kind of material parts.

On turning the page, we find the following sentence: "In the body there is no disease until there is structural distortion." Using the author's comparison, we believe it would be just as logical to say "There can be nothing wrong with an automobile unless the frame is twisted." People with ordinary intelligence realize, of course, that such is not the case. We also find that "The chiropractor may need the occasional assistance of an optometrist, surgeon, dentist, psychiatrist, orthopedist, medical physician, physical culturist, etc." This would be a safeguard if there were any information available which indicated that a chiropractor was trained to realize when he had need of these various other professions. But the very fact that he refers to surgeons and "medical physicians" in the same breath with optometrists and physical culturists indicates clearly that he has no such training.

Needless to say, the book explains the various methods and approaches which are used in the practice of this totally unscientific method of treating disease. As president of the University of Natural Healing Arts—whatever that is—the author should at least be well qualified to discuss the particular manipulations employed by these individuals. There is naturally much discussion of the human spinal column and the various nerve ramifications. That chiropractic is not an established science is illustrated by the fact that a man claiming these degrees and

his position can write a book on the subject without making reference to a single previous publication, either book or periodical.

Some of the illustrations are particularly interesting, including those called "Two-Hand Liver Squeeze," "Emptying the Gall Bladder," "Emptying the Stomach," "Tonsil Massage," "Finger Work on the Nose," "Releasing the Caecum and Appendix" and "Replacing a Floating Kidney." Under the chapter heading "Pertinent Suggestions" there is illustrated the proper method of "adjusting dumb animals and fowl," which, it is said, "usually brings much quicker results than adjusting humans." Apparently some of these dumb animals, however, are not so dumb, for we find the following sentence: "Until animals that might bite are accustomed to and like adjustments, they should be muzzled." We note, further, that "large animals, such as horses, sheep, cattle and large hogs, may require the use of a pleximeter and mallet or sledge."

Under the heading "Extension Swing Technic" we find the description of a device which, if one may believe the illustrations, is not at all dissimilar to the method used for treating horse thieves, except that the trap door is omitted. We note that "the patient should never attempt to raise the feet from the floor," which is just as well, for his neck is hung in a sling from the ceiling. It is noted that "there are no contraindications in the use of the extension swing—just precautionary suggestions," and that "patients who have Pott's disease, unusually weak and open spinal areas, or who are especially fearful, should be given unusually light treatments with probably no additional pull by the doctor for a period of several treatments." Among the definitions of applications the following appears: "A swing is any movement of the entire body over the ankles in the direction of the thrust whereby the momentum of the body can be used to gain power." After which, it may be presumed, the operator shifts into second.

In a postface, the following sentence appears: "To know what is wrong in disease is over half of the battle." You said it, brother, and the sooner you find out the better.

Nahrungsmitteltabelle zur Aufstellung und Berechnung von Diätverordnungen für Krankenhaus, Sanatorium und Praxis. Von Dr. Hermann Schall, Leitender Arzt der Kuranstalt Westend Königsfeld (Badischer Schwarzwald). Twelfth edition. Paper. Price, 5.40 marks. Pp. 126. Leipzig: Johann Ambrosius Barth, 1939.

Schall's tables of food values now appears in its twelfth edition. For physicians in the United States there are many tables that are more convenient and better applicable to American foods and dietary habits. For information about European foods, the book is invaluable. A physician recently had occasion to seek information about the approximate composition of anchovies, which a woman with diabetes wished to include in her diet. Although a thorough search of the ordinary tables was made, the information was not available except in Schall's compilation. There is contained in this book not only information about foods both common and rare but also data on the approximate composition of many German proprietary foods used in infant feeding.

A Manual for Diabetic Patients. By W. D. Sansum, M.D., Chief of the Staff of The Sansum Clinic, Alfred E. Koehler, Ph.D., M.D., Member of the Staff of The Sansum Clinic, and Ruth Bowden, B.S., Dietitian of The Sansum Clinic, Santa Barbara, California. Cloth. Price, \$3.25. Pp. 227, with 12 illustrations. New York: Macmillan Company, 1939.

The authors' purpose primarily is to familiarize the patient with his disorder so that the manual will serve as a guide supplementing the instructions he receives as a patient. However, there is the possible objection that the manual may be too technical and confusing for the average patient. Thus in the preface the authors raise the problem of diets—high fat, low carbohydrate and their so-called adequate carbohydrate diet—a discussion which tends to give a wrong impression to those not familiar with the authors' published data. The reader is puzzled first by the technical discussion and second by the impression that the authors of this book have a quarrel with the doctors advocating high fat diets. The lay reader or patient is not interested in such controversial problems of scientific men. The authors create the impression that high carbohydrate diet will answer the troubles of diabetic complications such as ketosis and arteriosclerosis and that the use of insulin has permitted the rejection of high fat diets. This is a highly debatable assumption.

BOOK NOTICES

tion. But, aside from this possible quarrel with the method of the authors, the manual has much to recommend it: the informative history of diabetes and its etiology, the uses of the slow acting insulins, and the arrangement of the diets. The book is attractive in its format and has numerous illustrations.

Laboratory Manual of the Massachusetts General Hospital. By Francis T. Hunter, M.D. Third edition. Fabrikold. Price, \$1.75. Pp. 119. Philadelphia: Lea & Febiger, 1939.

This pocket size manual contains directions for the collection of specimens for every type of laboratory determination. There is a chapter on therapeutic technic (blood transfusion, intravenous injections) and a chapter on prophylactic measures (such as vaccination). A specific method for determination of most of the emergency laboratory tests is given. The sources of error and precautions to be taken are included for most procedures. A method for quantitative blood sugar determination and one for presence of syphilis, two important emergency tests, are completely omitted. No laboratory manual of the scope of this one should be without these methods. Therefore this manual is recommended with reservation to interns of the Massachusetts General Hospital.

Gynäkologische Chirurgie. Von Dr. Konstantin Logothetopoulos, o. ö. Professor, Direktor der I. Universitäts-Frauenklinik in Athen. Paper. Price, 14.50 marks. Pp. 106, with 145 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

Logothetopoulos, of Athens, Greece, has written this monograph in German. It has the good and at the same time all the poor characteristics of the average German work of this type. Apparently to save publishing costs, it is poorly bound with a pasted paper cover. Not content with explaining in the preface that he is expounding his personal views and depicting his personal preferences in gynecologic technic as practiced in his Athens clinic, the author falls into another common Germanic fault. Illustration after illustration of methods and operative technic include in the descriptive caption the words "nach Logothetopoulos," until he has repeated his own name more times, probably, than any other one word in the entire book. The monograph depends more on the strikingly good illustrations than on the text in delivering its message, which is meritorious. The text itself is concise and attempts but little more than a forceful amplification of the legends accompanying the illustrations. This commends it for practical use, especially because the subject matter is well chosen and concisely presented. Logothetopoulos presents certain technical minutiae which, as he says, are by no means superfluous but rather may often effect definite improvements in the standard or conventionally accepted steps of some well known operation. He considers it especially important for young gynecologists to be well grounded in vaginal operations of all types and devotes considerable space to these. The subject matter is well indexed. The monograph is an exceedingly practical one, particularly for those undergoing their training years in the specialty.

Obstetrical Practice. By Alfred C. Beck, Professor of Obstetrics and Gynecology, Long Island College of Medicine, Brooklyn. Second edition. Cloth. Price, \$7. Pp. 858, with 1,043 illustrations. Baltimore: Williams & Wilkins Company, 1939.

The appearance of a new edition of this book so soon after its initial publication is undoubtedly an indication of the popularity it has attained. The present edition has retained the general aspects of the original volume, but it includes interesting new data which have accumulated since the last publication. The physiology of reproduction has been presented in greater detail and includes some of the newer concepts of menstruation, ovulation and the physiology of the placenta and fetus. The embryology of the first few weeks is clearly but briefly described in the light of the classic contributions of Streeter and his associates at the Carnegie Institution of Embryology. There has been less improvement in some of the clinical sections of the book. Little space is devoted to the nonconvulsive toxemias of pregnancy in comparison to the great amount devoted to eclampsia. The nonconvulsive toxemias comprise 6 or 7 per cent of all admittances to large maternities and are responsible for a greater incidence of maternal and fetal morbidity and mortality. Furthermore, the convulsive toxemias still depend largely on the proper treatment of the nonconvulsive conditions. In the treatment of placenta praevia too great emphasis is still being placed on delivery through the natural passages. The use of

Braxton Hicks version and intra-uterine bags is gradually replaced by other methods in most institutions. Tampo's little if any place in the treatment of this serious condition in the United States. No mention is made of the use of W. edition can be heartily recommended to students and practitioners. Its clear, concise presentation of material lends it to daily use.

Qualitative Analysis by Spot Tests: Inorganic and Organic Analyses. By Dr. Ing. Fritz Feigl, Director of the Research Laboratory, belge de recherches et d'études, Ghent. Second English edition translated from the third German edition by Janet W. Matthews, Ph.D., F.I.C. Cloth. Price, \$7. Pp. 462, with 27 illustrations. New York: Hermann Publishing Company, Inc.; Amsterdam: "Elsevier," 1939.

Fritz Feigl's name is associated as closely with the "Spot analysis" as Fritz Pregl's name is with the "Organische Analyse." Both men share equally in the fame of having an international interest in a subject which was the outgrowth of their personal professional hobby. Fritz Pregl, a physician skilled in his specialty as eye surgeon and a master in all chemical methods in his physiologic experimentation, is but in all countries and nations his methods are standard. Fritz Feigl, however, pursues his present work not in the guest between St. Andrews, Scotland, and Ghent, Belgium, having resigned his position at the University of Vienna in 1933. His "spot testing" is rapidly spreading and already forms an integral part in the chemical education of the young scientist. The present edition is surprisingly enlarged and includes all the literature known on the subject. The contents of the book are divided into the following chapters: fifteen pages of general information, 145 pages on tests for metals, eighty-two pages on tests for acids, twenty-three pages on systematic analysis of mixtures, 101 pages on tests for organic chemicals, fifty-four pages on tests for specific applications in biology, medicine and technology, and eleven pages of tables and forty-two pages of index. The book contains a number of printing mistakes which are, however, not too disturbing. It is suggested for the coming edition that the subject index be expanded by improving the cross-indexing of all subjects. The book is indispensable for all research workers especially interested in the biochemical mechanism of trace elements because it gives the limit concentration for each reagent. Once again Janet W. Matthews must be thanked for her fine spirit of cooperation and for the gift of her time and energy in making available this standard reference work for the English speaking scientist.

How to Keep Well. By Irving S. Cutter, M.D., Dean of the Medical School, Northwestern University, Chicago. A Selection of Articles Reprinted from the Chicago Tribune Editorial Feature "How to Keep Well" with a foreword by Charles H. Mayo, M.D. Paper. Price, 5 cents. Pp. 76. Chicago: Chicago Tribune, 1939.

This pamphlet contains thirty-seven articles from Dr. Cutter's daily health column published in the Chicago Tribune and its newspapers. It deals with such subjects of common interest as accidents, sunbaths, oily skin, frozen foods, blood pressure, constipation, headaches, fainting, tuberculosis, reducing and first aid. Each article is accompanied by a few questions and answers usually unrelated to the subject of the article. There is much useful information for the layman of inquiring mind interested in his health.

Food and Life: Yearbook of Agriculture, 1939. United States Department of Agriculture. Cloth. Price, \$1.50. Pp. 1,165, with illustrations. Washington, D. C.: Supt. of Docs., Government Printing Office, 1939.

It is doubtful that one can buy anywhere for \$1.50 more than is accurate and scientific on the subject of food than is available in this volume issued by the Department of Agriculture. The third of the book deals with the nutrition of animals and the third with nutrition in human beings, but it must be remembered that all of the important research on nutrition of animals is applicable to some extent to the nutrition of the human animal. The book is divided into two main parts, on human nutrition and on animal nutrition. The section on human nutrition, written by a variety of authorities who are government employees or have served as consultants, discusses the needs of the people, each of the essentials of the diet and analyzes present day diets, the campaigns of the faddists and our food habits. It also considers the technics by which our food supplies are produced and the importance of a campaign for better national nutrition.

The animal section is devoted to some fifty essays dealing with the development of meat, milk and other animal products used in the diet. Also considered is the feeding of dogs and of goats, of horses and mules and other live stock. The book is excellently printed and is supplemented by an extensive bibliography and a fine index.

The Fight on Cancer. By Clarence C. Little, Sc.D. Public Affairs Pamphlets No. 38. Paper. Price, 10 cents. Pp. 31, with illustrations. New York: American Society for the Control of Cancer, Inc., 1939.

This pamphlet tells all that the public needs to know about cancer and how to approach the problem of its prevention, early recognition and, in from 50 to 95 per cent of many kinds of cancer, its cure. Written by a leading biologist and educator, its authenticity is assured. Its style is simple, clear and concise. The statistics are presented by the pictorial method and are not so extensive as to be discouraging. The price of the pamphlet makes it available to all. It should be widely read by individuals and used in educational projects both in schools and in community movements such as the Women's Field Army, organized for cancer education by the American Society for the Control of Cancer in close cooperation with state medical society cancer committees.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Insurance, Accident: Death from Anaphylactic Reaction to Antitetanus Serum.—The insured had two life insurance policies, one with the Prudential Insurance Company of America and the other with the Metropolitan Life Insurance Company, under each of which additional benefits were payable if death resulted from bodily injury sustained solely through external, violent and accidental means. The insured received a head injury and in addition to necessary local treatment was given an injection of antitetanus serum. He died ten days later from acute nephritis attributed to an anaphylactic reaction to the serum. Both companies refused to pay the additional benefits, contending that death resulted from a bodily infirmity for which the additional benefits were not payable. The beneficiary brought suit against each company. In the *Prudential* case the trial court gave judgment for the beneficiary. In the *Metropolitan* case, there was a directed verdict for the company. Both cases came before the superior court of Pennsylvania on appeal. The determinative issue in each case was whether the hypersensitiveness to the antitetanus serum constituted a bodily infirmity.

In the *Prudential* case, the court quoted with approval from *Arnstein v. Metropolitan Life Insurance Company*, 329 Pa. 158, 196 A. 491, as follows:

The latter term (bodily infirmity) in insurance policies has uniformly been construed to mean a condition of a settled and substantial character materially impairing the bodily processes, and not to cover minor physical defects and ailments which are frequent incidents of life, speedily forgotten, and not affecting the general soundness and healthfulness of the system. Even a dormant duodenal ulcer has been held not to be a disease or bodily infirmity within the meaning of those terms in a policy. . . . The same has been ruled in regard to burns about the ankles, leaving scar tissue . . . and to intestinal adhesions resulting from a hernia operation . . . An ingrown toe nail no more constitutes "bodily infirmity" than would an impacted tooth.

In the present case, the court pointed out, there was a chain of events consisting of four links; first, the accidental blow on the head; second, the injection of antitetanus serum as a part of the treatment; third, the existence of the hypersensitiveness to the serum, and, fourth, the fatal nephritis attributed to the hypersensitiveness to the treatment. The trial court was justified in finding, in the opinion of the appellate court, that the hypersensitiveness was not a disease or bodily infirmity within the common acceptance of those words; that it of itself would never have even inconvenienced the insured nor would its existence have been discovered if the serum had not been injected, and that the serum would not have been injected if the insured had not suffered the accidental injury to his head. The court, there-

fore, could see no reason for disturbing the judgment of the trial court for the plaintiff.

In the *Metropolitan* case, the superior court held that the trial court erred in directing a verdict for the company and in refusing to grant a new trial, its action being based on the assumption that the hypersensitiveness of the insured to the antitetanus serum was a bodily infirmity. The judgment for the company was therefore reversed.—*Gyulai v. Prudential Ins. Co. of America* (Pa.), 4 A. (2d) 824; *Gyulai v. Metropolitan Life Ins. Co. (Pa.)*, 4 A. (2d) 828.

Malpractice: Fracture of Jawbone in Extraction of Tooth.—The defendant dentist undertook to extract an impacted wisdom tooth from the plaintiff's lower jaw. In releasing the tooth from the jawbone the defendant struck the chisel with such force that the bone broke. The plaintiff thereafter instituted a malpractice action in the supreme court of New York, New York County. The plaintiff himself, the only witness who testified, described the operation and said that the defendant at the close of the operation admitted that he himself had caused the untoward result by striking the chisel with the mallet "too hard." At the close of the plaintiff's case, the court dismissed the suit. The plaintiff then appealed to the supreme court, appellate division, first department.

The question, said the supreme court, is whether in the absence of expert medical testimony the plaintiff established a prima facie case of lack of ordinary care on the part of the defendant. As a general rule, where the exercise of proper skill or care on the part of the physician, surgeon or dentist is in issue, expert medical testimony is required to show that the untoward results complained of might have been avoided by due care. Expert evidence, however, is not required where the results of treatment warrant the inference of want of care from the testimony of laymen in the light of the knowledge and experience of the jurors themselves. It does not require surgical knowledge or skill, said the court, to apprehend that a result such as occurred in this case would not ordinarily occur if reasonable care had been exercised by the operator. The proof offered by the plaintiff established a prima facie case. What explanation, if any, the defendant might have had for breaking the plaintiff's jawbone was a matter of defense to be developed on the trial. In the absence of proof that this unanticipated result might have happened even though proper care and skill had been exercised, the trial court should not have dismissed the complaint. The judgment of the trial court was therefore reversed and a new trial ordered.

In a dissenting opinion, however, two of the justices took the position that the degree of force to be applied in hammering was a matter of judgment. The defendant applied the chisel at the proper point but erred in his judgment as to how hard a blow he might apply with the mallet. His admission that he hit too hard showed only that he had misjudged the amount of force to be applied. No presumption of negligence should arise from an error of judgment or solely on the basis of an unfortunate result. In the absence of proof of extreme force or expert proof that the force applied was such that a reasonably prudent dentist exercising adequate professional skill should have anticipated an untoward result from it, the plaintiff, in the opinion of these dissenting justices, failed to establish a prima facie case.—*Zettler v. Reich* (N. Y.), 11 N. Y. S. (2d) 85.

Compensation of Physicians: Incurability of Patient's Disease.—The plaintiff sued in the superior court, DeKalb County, Ga., to recover \$140 that she had paid the defendants, chiropractors, for treating her minor child, contending that the money she had paid them had been obtained by false and fraudulent representations. She alleged that the defendants falsely and fraudulently misrepresented the condition of her child for the purpose of securing employment and that in reliance on their misrepresentations she did employ and pay them. Through technical procedures not necessary here to detail the case was brought on writ of error to the court of appeals of Georgia, division No. 1.

The law, said the court of appeals, does not require a physician to guarantee the results of his treatment. If, however, in a contract between the parents of a minor child and the physician in attendance the physician's right to compensation is made

dependent on his curing the patient, the contract is valid and binding. Where a physician agrees to cure a patient and fails to do so, the patient is absolved from payment and may recover advances made, such as expenditures for nurses and medicines. *Frankel v. Wolper*, 181 App. Div. 485, 169 N. Y. S. 15.

If in the present case the defendants stated to the plaintiff that it was their belief that the patient did not have an incurable disease, it was not enough for the plaintiff to show that in fact the disease was incurable. To prove absence of good faith, it must be shown that the defendants fraudulently represented that they believed that the patient did not have an incurable disease, whereas, as a matter of fact, they did not so believe. The affirmation of their belief was the affirmative fact, and if it was fraudulently made to mislead or cheat another, to abuse his confidence or to blind his judgment, that affirmation was in law and morals just as reprehensible as if any other fact had been affirmed for like purpose. Where any one, as a physician, possesses special learning or knowledge on the subject with respect to which he expresses an opinion and for the purpose of obtaining employment makes a false statement and representations to one who is ignorant on the subject, and where deception is intended and money is obtained thereby, the person responsible for the deception is liable for the amount thus fraudulently obtained. Since fraud vitiates every contract which may be based on it, the conclusion follows that the money obtained by false and fraudulent representations may be recovered.—*Lake et al. v. Baccus (Ga.)*, 2 S. E. (2d) 121.

Workmen's Compensation Acts: Dementia Paralytica Attributed to Aggravation of Preexisting Syphilis by Heat Stroke.—The employee in this case filed a claim for compensation alleging that during the course of his employment he suffered a "nervous breakdown" owing to the heat to which he was subjected. The state industrial commission awarded compensation and the employer appealed to the Supreme Court of Oklahoma.

The employee had for approximately two years immediately preceding Aug. 22, 1936, worked in a plant near Ponca City, Okla., in which his duties required him to be in and around the boiler room. During this time he was an able and satisfactory worker. The nature and location of his work were such as to expose him to high temperatures and occasionally to intense heat. There was evidence that he suffered a heat-stroke during the latter part of July 1936, another about the middle of August of that year and a severe attack on the night of August 22. After quitting work that night, he drove to Harrah, Okla., and there gave evidence of being in an "abnormal condition." On his return trip he wrecked his automobile but sustained only minor injuries. His mental condition, however, alarmed his relatives and on their application he was examined by a board duly convened to pass on his sanity and was committed to an asylum. There his condition was diagnosed as general paresis of syphilitic origin. He responded favorably to treatment and was discharged from the asylum about July 15, 1937, and was restored to competency by the court that had committed him to the asylum. Shortly thereafter he filed his application with the commission for compensation.

The employee had no history of insanity in his family. His blood reacted negatively to a Wassermann test, but a spinal fluid test gave evidence of syphilis. The medical testimony was in agreement that the employee had a brain lesion and that he was temporarily totally unable to perform ordinary manual labor. The testimony, however, was in irreconcilable conflict as to whether the lesion had been caused by overheating or by the preexisting syphilis or had resulted from a combination of the two. The commission found that the heat stroke suffered by the employee had aggravated a latent or dormant syphilitic infection and that dementia paralytica had resulted therefrom.

The benefits of the workmen's compensation act, said the Supreme Court, are not confined to traumatic injury; a heat-stroke or heat exhaustion may constitute an accidental injury. The injury suffered by the employee in this case was one, the court said, which required skilled and professional men to determine its exact nature and extent, and while the testimony was in conflict the industrial commission was at liberty to

choose which of the witnesses it would believe and what weight it would give to their testimony. The court thought that the commission had before it competent evidence which, if believed, was sufficient to support a finding of accidental injury within the meaning of the workmen's compensation act. The award of compensation was therefore affirmed.—*Oklahoma Gas & Electric Co. v. Maloney (Okla.)*, 88 P. (2d) 363.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Hiram A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 14-15. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for the Study of Neoplastic Diseases, Louisville, Ky., Apr. 11-13. Dr. Eugene R. Whitmore, 2139 Wyoming Ave., N.W., Washington, D. C., Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
- American Association on Mental Deficiency, Atlantic City, May 22-23. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American College of Physicians, Cleveland, Apr. 1-5. Mr. E. R. Lovell, 4200 Pine St., Philadelphia, Executive Secretary.
- American Orthopedic Association, Kansas City, Mo., May 6-9. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
- American Psychiatric Association, Cincinnati, May 20-24. Dr. Arthur Ruggles, 305 Blackstone Blvd., Providence, R. I., Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- American Surgical Association, St. Louis, May 1-3. Dr. Charles Mixer, 319 Longwood Ave., Boston, Secretary.
- Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie Kober, 15 East Monroe St., Phoenix, Secretary.
- Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brock, 602 Garrison Ave., Fort Smith, Secretary.
- Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
- California Medical Association, Coronado, May 6-9. Dr. George H. Knapp, 450 Sutter St., San Francisco, Secretary.
- Connecticut State Medical Society, Hartford, May 22-23. Dr. Crest Barker, 258 Church St., New Haven, Secretary.
- Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Illinois State Medical Society, Peoria, May 21-23. Dr. Harold M. Coe, 224 South Main St., Monmouth, Secretary.
- Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Paul, 3510 Sixth Ave., Des Moines, Secretary.
- Kansas Medical Society, Wichita, May 15-16. Mr. Clarence G. Meyer, 112 West Sixth St., Topeka, Executive Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.
- Massachusetts Medical Society, Boston, May 21-22. Dr. Alexander Begg, 8 Fenway, Boston, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Mississippi State Medical Association, Jackson, May 14-16. Dr. T. Dye, McWilliams Bldg., Clarksdale, Secretary.
- Missouri State Medical Association, St. Louis, Apr. 30-May 1. Mr. E. Bartelsmeyer, 1000 Olive St., St. Louis, Executive Secretary.
- Nebraska State Medical Society, Omaha, Apr. 22-23. Dr. R. Adams, 416 F. St., Omaha, Secretary.
- New Hampshire Medical Society, Manchester, May 14-15. Dr. Carl R. Metcalf, 5 South State St., Concord, Secretary.
- New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
- New York State Association of Public Health Laboratories, Rochester, May 20. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- North Carolina, Medical Society of the State of, Pinehurst, May 13-14. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.
- North Dakota State Medical Association, Minot, May 6-8. Dr. Albert Skeley, 20 1/2 North Broadway, Fargo, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 23-24. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. Nelson, 79 East State St., Columbus, Executive Secretary.
- Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Wain, 210 Plaza Court Bldg., Oklahoma City, Secretary.
- Pacific Coast Surgical Association, Portland, Ore., Apr. 3-6. Dr. Glenn Bell, University of California Hospital, San Francisco, Secretary.
- Pennsylvania, Association for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. A. Hines, Seneca, Secretary.
- South Dakota State Medical Association, Watertown, May 22-23. Dr. Clarence E. Sherwood, Madison, Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. Shoulders, 706 Church St., Nashville, Secretary.
- Texas, State Medical Association of, Dallas, May 13-16. Dr. H. Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

19: 1-128 (Jan.) 1940

Studies on Relation of Clinical Manifestations of Angina Pectoris, Coronary Thrombosis and Myocardial Infarction to Pathologic Findings, with Particular Reference to Significance of Collateral Circulation. H. L. Blumgart, M. J. Schlesinger and D. Davis, Boston.—p. 1.

Activation of Renin by Blood. K. G. Kohlstaedt, I. H. Page and O. M. Helmer, Indianapolis.—p. 92.

American Journal of Diseases of Children, Chicago

59: 219-458 (Feb.) 1940

Noma. A. Eckstein, Ankara, Turkey.—p. 219.

The Diabetic Child: Analytic Study of His Development. G. D. Brown, Berkeley, Calif., and W. H. Thompson, Minneapolis.—p. 238.

Individual Growth Records of Two Healthy Girls from Birth to Maturity. H. Gray and H. K. Faber, San Francisco.—p. 255.

Human Hemolytic Streptococci from Diseases of Children. P. L. Boisvert, New Haven, Conn.—p. 281.

Factors Influencing Retention of Nitrogen and Calcium in Period of Growth: III. Puberty in Normal Girl and in Girl with Minimal Reinfection Type of Tuberculosis. J. A. Johnston, Detroit.—p. 287.

Use of Combination Microhemopipet, with Special Reference to Sedimentation Rate, Packed Cell Volume and Icteric Index in Pediatric Practice. K. Kato, Chicago.—p. 310.

*Smallpox Vaccination of Newborn Infants with Culture Virus and with Calf Lymph Virus: Comparative Study of Intradermal and Cutaneous Vaccination with Two Viruses in Over a Thousand Infants. H. H. Donnelly, M. M. Nicholson, W. S. Anderson and M. H. Grosvenor, Washington, D. C.—p. 322.

Stabilization of the Diabetic Child. R. L. Jackson, J. D. Boyd and Thelma E. Smith, Iowa City.—p. 332.

Diphtheria Immunity and Frequency Distribution Curves for Antitoxin. H. E. Thelander, San Francisco.—p. 342.

Smallpox Vaccination of Newborn Infants.—According to Donnelly and his associates it is generally admitted that smallpox vaccination should be done for the first time in early infancy; the choice of age varies from the third month to the end of the first year. Healthy full term babies can be vaccinated the day of their birth with practically no risk at all. The authors' study of vaccination of newborn infants has included the inoculation of more than 500 newborn infants with culture virus (Rivers) by the intradermal method. This group was compared with a group of 313 newborn infants inoculated intradermally with diluted calf lymph. Rivers devised a culture virus for the cutaneous method of vaccinating. In this study there are reported the reactions of 128 infants given cutaneous inoculations with this material, and comparison is made with the reactions of 134 infants in a control group given cutaneous inoculation with undiluted glycerolated calf lymph treated with brilliant green (obtained from the Bureau of Laboratories of the city of New York). The authors reach the following conclusions: cutaneous and intradermal vaccination of newborn infants with calf lymph virus from the New York City Bureau of Laboratories, undiluted and diluted 1:100 respectively, yielded the same percentage of takes, 93. The percentage of successful takes in newborn infants vaccinated intradermally with culture virus (Rivers) was somewhat lower, approximately 80. Cutaneous vaccination with culture virus mixed with sterile egg white, desiccated and rubbed into the skin scratches, yielded takes in only 10 per cent of newborn infants. Its use therefore is not recommended. The cutaneous reaction and the invasiveness of the virus, indicated by the lymphadenopathy, are practically identical with the culture virus and the diluted calf lymph when both are used intradermally. Minimal cutaneous trauma accompanied intradermal vaccination. Bacterial infection was apparently absent. The intradermal use of culture virus and of calf lymph diluted 1:100 generally yielded mild cutaneous lesions in newborn infants.

Unexpectedly marked cutaneous reactions occasionally occurred with the use of both viruses. Likewise, mild cutaneous reactions with both viruses at times left doubt as to whether they should be regarded as takes. Lymphadenopathy present in more than 80 per cent of the babies favored the interpretation of the inoculation as successful.

American Journal of Surgery, New York

47: 261-552 (Feb.) 1940. Partial Index

Skin and Fascia Grafting. A. G. Brenizer, Charlotte, N. C.—p. 265.
Use of Small Deep Grafts in Repair of Surface Defects. J. S. Davis, Baltimore.—p. 280.

*High Tension Electric Burns. C. R. Edwards and H. C. Bowie, Baltimore.—p. 299.

*Relation of Trauma to Inguinal Hernia: Analysis of 1,376 Herniotomies. J. J. Moorhead, New York.—p. 312.

*Transient False Meningocele: Clinical Entity: Preliminary Report. E. J. Bozsan and T. I. Brennan, New York.—p. 334.

Brain Abscess of Traumatic Origin. J. E. J. King, New York.—p. 348.

Use of Antiseptics in Treatment of Open Wounds. W. L. Estes Jr., Bethlehem, Pa.—p. 369.

Primary Closure of Traumatic Wounds, with Especial Reference to Conversion of Compound into Simple Fractures. J. E. Cannaday, Charleston, W. Va.—p. 375.

Misuse of Skeletal Traction. C. Mathewson Jr., San Francisco.—p. 408.

Simple Effective Method for Treatment of Fractures of Upper Two Thirds of Humerus. F. B. Gurd, Montreal.—p. 443.

Experimental Fat Embolism. J. D. Bisgard and C. Baker, Omaha.—p. 466.

Primary Repair of Severed Tendons: Use of Stainless Steel Wire. S. Bunnell, San Francisco.—p. 502.

Traumatic Lesions of Nerves of Wrist and Hand. T. W. Harmer, Boston.—p. 517.

Knee Injuries Incident to Sports and Recreation. A. Thorndike Jr., Boston.—p. 542.

High Tension Electric Burns.—Because of the kind of duties performed by electricians working about high tension wires and equipment, Edwards and Bowie state that at least one point of contact will usually be the hand and frequently both hands and feet. Since, next to bone, skin offers the greatest resistance to electricity, and the greater the resistance the greater the burn, it is a common experience to see severe burns in the hands, especially of hard, calloused hands. The tendons and ligaments come next before the superresistant bone is encountered, and the rich vascular plexus, the best conductor of electricity within the body, is to be found throughout both the hands and the feet. Electric current kills tissue, once contact has been established. Charring of tissue is more definite and instantaneous the higher the voltage, up to 5,000 to 10,000 volts. Therefore, in the somewhat lower level of high voltage current, damage to tissues not immediately manifest by desiccation or charring is frequently encountered. The current penetrates deeply through skin and underlying structures, often charring only the superficial layer of skin, but enough damage is done to the tendon sheaths and tendons to set up an inflammation resulting in dense adhesions between these structures. Sometimes what appears to be a superficial injury develops into a very serious and far reaching one, and the reverse is also true. Burns over joints and tendons are often apparently trivial but within a few days are found to be quite extensive. If an immediate débridement is undertaken the tendon sheaths and joint spaces will be opened widely, while if conservative treatment is carried out sufficient granulation will occur to seal these spaces beneath the slowly separating coagulum. When bone is attacked by high tension current most of the damage is done to the cortical layer. Dead bone slowly separates, and when the sequestrum has been removed the area can soon be prepared for skin grafting. The authors report eighteen cases of electric burns and point out that the customary classification of burns should not be applied to those due to electric currents.

Trauma and Inguinal Hernia.—Moorhead concludes, from an analysis of 1,376 herniotomies in which trauma was the alleged causative factor of inguinal hernia, that isolated trauma, a single act of violence, is never the sole producing cause and that trauma may act as an aggravating factor only when certain criteria obtain. Trauma is unrelated to the causation of hernia in the absence of demonstrable laceration of the overlying structures. However, trauma can aggravate, accelerate, accentuate, increase or modify hernia if the accompanying circumstances so indicate. The essential of these circumstances is the increase of intra-abdominal pressure. Only one other element, in the absence of penetration, is equally productive: deliberate or pur-

poseful dilation of the external ring, the inguinal canal or the internal ring. This procedure is still accomplished by professionals in certain countries in which military service is obligatory, for the presence of hernia is cause for rejection. At operation for hernia the picture usually denotes an ancient process, as indicated by extrasaccular and intrasaccular adhesions. Examination of the sac demonstrates a chronic peritonitis and fibrosis. Hernia is a chronic progressive disease, a ptosis, a diverticulum, and very rarely an acute surgical entity. A large proportion of men have hernia and do not know it. If trauma is to be accused and found guilty, it should not be medicolegally seductive or speculative but medicosurgically deductive and positive. Trauma has burdens enough without being saddled with this ancient heritage, which modern traumatology should cast into the discard along with grape seeds as a cause of appendicitis.

Transient False Meningocele.—Observation of twenty-nine head injuries in a large clinic during the last ten years has convinced Bozsán and Brennan that a particular type of false meningocele, bearing constant features, occurs rather frequently in children following blunt head injuries. The main characteristic of this type of cerebrospinal fluid collection is that it disappears spontaneously without any treatment and that the outcome is favorable. The clinical features of this type of false meningocele are as follows: Immediately or days after a blunt head injury a painless swelling appears on the head, covering at times the whole of the cranial vault. The covering skin does not show any trace of extravasated blood, edema, bruise, ecchymoses or discoloration. In most cases the swelling shows loose watery fluctuation, often permitting palpation of the underlying bone and never disclosing snowball crepitus. It transilluminates with the pink hue of a hydrocele. A day after its appearance a circular rim appears at the base of it, which leads to the erroneous conclusion of a depressed fracture. Roentgenograms show that the skin over the false meningocele is of uniform thickness over the whole extent of the swelling and that it is the same as that of the surrounding skin. Under the skin and separated from it by a narrow cleft is a smoothly outlined shadow of even density hugging the surface of the skull. All structures, bone, fluid and skin, are clearly separated and their borderlines are not blurred or lost. The presence of spinal fluid is indicated by the at times rapid disappearance of the swelling. Thickening or fixation of the scalp does not follow. The belated appearance of the swelling, from days to two weeks after the accident, generally after resumption of more vigorous activity, is further evidence that the swelling is not a hematoma. In one of the authors' cases the appearance of the swelling two days after the accident was preceded by a period of restlessness and drowsiness, indicating increased intracranial pressure, which disappeared simultaneously with the appearance of the swelling. In another case spinal puncture made the swelling disappear, to reappear the next morning. Circumstantial evidence seems to prove that these swellings contain mainly spinal fluid even if mixed with blood. The authors are definitely opposed to the practice of proving the presence of spinal fluid by puncture and aspiration as the literature records a number of fatalities after such aspirations. The mechanism by which the spinal fluid under the scalp escapes is also characteristic. It accompanies that type of skull fracture in children called indirect. In these accumulations a constant absorption of spinal fluid takes place. This establishes an efficient decompression, not only by forming a temporary reservoir, but also by eliminating a quantity of the excess fluid. The absorption of the fluid is rapidly followed by the disappearance of the rim. The skull becomes smooth and in two or three days the scalp is again movable over the entire head. The type of trauma determines whether the meningocele will be permanent or transient. If a false meningocele appears over a gunshot or operative wound or over a comminuted fracture due to direct trauma, it tends to be permanent. Owing to loss of substance or displacement of fragments, the chances of spontaneous closure are unfavorable. The indirect fractures in children, on the other hand, tend to close as the skull regains its shape and to give rise to the transient type. The exception to this rule is when the mechanism of indirect fractures results in the bursting of a suture line. The age of the authors' patients was between 1 and 13 years. The collection appeared immediately after the accident in seventeen cases and in from one to

fourteen days in twelve. The duration of the collections varied between two and twenty-eight days. X-ray evidence of underlying fracture was present in twenty-seven cases and was absent in two. The general condition of the patients was severe in five, moderate in ten and mild in fourteen. In four the collection covered the whole vault, in twenty-five it was partial. The collection was symmetrically placed in two patients and in twenty-seven it was single. The immediate prognosis of the passing collections of spinal fluid is favorable.

American Journal of Tropical Medicine, Baltimore

20: 1-168 (Jan.) 1940

- Future of Tropical Medicine. A. C. Reed, San Francisco.—p. 1.
Progress in Study of Infections Due to Bartonella and Rickettsia. F. J. Strong, Boston.—p. 13.
Ninth Year's Observations on Malaria in Panama, with Reference to Occurrence of Epidemic Following Continued Treatment with Atabrine and Plasmochin. H. C. Clark, W. H. W. Komp and D. M. Johnson, Ancon, Canal Zone.—p. 47.
Strains or Races of Malaria Parasites. M. F. Boyd, Tallahassee, Fla.—p. 69.
Malaria Reconnaissance of Province of Oriente in Cuba. H. P. Gray, J. F. Meléndez and A. Ros, Havana, Cuba.—p. 81.
*The Food Handler as a Transmitter of Amebiasis. A. W. Schoenleber, New York.—p. 99.
Studies on Amebiasis: I. Pathogenesis of Mucosal Penetration. R. W. Nauss and I. Rappaport, New York.—p. 107.
Correlation Between Incidence of Stomach and Gland Infection in Anopheles Quadrimaculatus Infected with Plasmidium Vivax. M. F. Boyd, Tallahassee, Fla.—p. 129.
Observation on Swarming of Anopheles Maculipennis, Var. Atroparvus. F. J. C. Cambournac and R. B. Hill, Aguas de Moura, Portugal.—p. 133.

The Food Handler as a Transmitter of Amebiasis.—According to Schoenleber, 1,500 Americans recruited from localities in the United States where the average amebic infection rate is not more than 10 per cent were transported to the island of Aruba, where they lived for years without prophylactic measures against the dissemination of amebic infection by carriers. This group lived under conditions which precluded the possibility of acquiring amebic infection from water, flies, sewage or soil contamination of food. Stool examinations after several years of residence under such conditions showed an annual infection rate of 25.57 per cent and an amebic colitis rate of 36.84 per thousand. A stool examination of food handlers in this camp showed that 33 per cent were carriers. As a result of active measures for the control of the dissemination of the infection only by food handlers the infection rate was reduced 50 per cent after one year and 92 per cent after three years of such activities. The experience adds evidence that transmission of amebiasis by carriers occurs.

Archives of Ophthalmology, Chicago

23: 237-476 (Feb.) 1940

- Endophthalmitis Phaco-Anaphylactica and Its Relation to Sympathetic Ophthalmia. J. A. deVeer, Brooklyn.—p. 237.
Angiomatosis Retinae (Hippel's Disease): Report of Case in Which Roentgen Therapy Was Used in Early Stage. F. C. Cordes and M. J. Hogan, San Francisco.—p. 253.
*Cyclodialysis with Insertion of Metal Implant in Treatment of Glaucoma: Preliminary Report. M. U. Troncoso, New York.—p. 270.
*Treatment of Secondary Glaucoma. S. R. Gifford, Chicago.—p. 311.
Tangent Screen Scotometry: Value in Diagnosis, Prognosis and Evaluation of Therapy. W. F. Duggan, Utica, N. Y.—p. 316.
Cycloplegia and Mydriasis by Use of Atropine, Scopolamine and Homatropine-Paredrine. J. Marron, Chicago.—p. 340.
Experimental Studies of Ocular Tuberculosis: IV. Relation of Ocular Sensitivity, Cutaneous Sensitivity and Ocular Activity in the Immune Allergic Rabbit. A. C. Woods, E. L. Burky and J. S. Friedland, Baltimore.—p. 351.
Id.: V. Question of Organotropism or Selective Sensitization of the Second Eye. A. C. Woods and E. L. Burky, Baltimore.—p. 353.
Failure of Galactose Given Subcutaneously to Produce Cataract in Rats. R. M. Selle, Los Angeles.—p. 369.
Role of Cervical Sympathetic Nerve in Light Reflex of Pupil. E. A. Spiegel, Philadelphia, and N. P. Scala, Washington, D. C.—p. 371.

Cyclodialysis with Metal Implant for Glaucoma.—Troncoso describes an operation for glaucoma in which a piece of magnesium is implanted in the wound between the sclera and the ciliary body after cyclodialysis, in order to avoid reattachment of the ciliary body to the sclera. Contrary to what happens with other metals, magnesium disintegrates easily, is absorbed by the tissues in about two or three weeks, is harmless and produces little reaction. The author experimented with this method on the eyes of eighteen rabbits, two dogs and one monkey. He

performed the same operation on twelve human eyes. In the beginning he used the magnesium implant in blind eyes with absolute glaucoma, and when its easy absorption and harmlessness were demonstrated he applied the method in seeing eyes affected with subacute, chronic congestive, simple and congenital glaucoma. Of the twelve operations, two were performed on the same eye. The first operation was done sixteen months ago and its good results are still apparent in the normalization of tension. The usefulness of the implantation can be appraised when it is borne in mind that, in all except three, other types of operation had been performed before with poor results. In only one case was there no improvement. Following implantation of magnesium after cyclodialysis there is at first a mild foreign body reaction, with numerous bubbles of gas appearing in the anterior chamber and under the conjunctiva. The reaction subsides in about one week, and the metal is entirely absorbed at the end of twenty days. The method is harmless and can be repeated several times in the same eye. The condition of the angle before the operation has much to do with the final result and should be investigated. The results have been excellent and durable in the normalization of tension with open angles.

Treatment of Secondary Glaucoma.—Gifford discusses the treatment of seventy cases of secondary glaucoma: twenty due to injury, fourteen to uveitis, nineteen to cataract extraction, six to discission, five to thrombosis of the central vein, two to subluxation of the lens and one each to cycloplegia, serpent ulcer, radium therapy and rosacea keratitis. The author agrees with Tillema that many cases of post-traumatic glaucoma can be prevented by avoiding the use of atropine. When glaucoma does occur the use of miotics is sometimes successful, while in others paracentesis or iridectomy is necessary. The most important measure is to be on the constant watch for glaucoma after injury, so that appropriate measures may be taken early. The use of the tonometer is the only way by which glaucoma can be detected in an early stage in many cases. There is no risk involved in its proper application unless an open wound is present. The prognosis of glaucoma following thrombosis of the central vein has been uniformly poor, as usually neither surgical nor nonsurgical treatment is of any value when the condition is established. The case of postcycloplegic glaucoma occurred after the use of atropine and was controlled for a year by miotics with occasional mild attacks. Peripheral iridectomy resulted in tension of from 12.5 to 15 mm. without miotics. Vision remained 20/15. The glaucoma due to rosacea keratitis may also have resulted from the use of atropine. The glaucoma due to radium therapy did not respond to miotics, and every operation was followed by intra-ocular hemorrhage with return of tension. Tension was finally brought to normal, but the visual result was poor. In glaucoma secondary to uveitis the iritis was treated with the cautious use of miotics when the tension rose, and when the tension was controlled mydriatics were begun. In cases in which the tension was not controlled by miotics or their use was undesirable because of plastic exudate, hypertonic solutions by vein were useful and in some cases obviated the need of paracentesis. Glaucoma following cataract extraction occurred after extracapsular extraction. The author has had no such cases after intracapsular extraction. The tonometer should be used postoperatively as a routine procedure in any case in which there is postoperative iritis and probably in all cases. Glaucoma usually develops when the iritis has become almost or completely quiescent. In this stage miotics are not contraindicated, and in early cases they may be effective. The prolonged use of atropine is undoubtedly responsible for glaucoma in some cases. Epinephrine is dangerous in forms of glaucoma accompanied by inflammation; following cataract extraction it has often proved useful. When other measures fail, operative measures are as important as in any other form of glaucoma. Delay has undoubtedly been responsible for an unfortunate outcome in many cases. Cyclodialysis is advocated for glaucoma following cataract extraction or discission. The operation reduced the tension in six of the eight cases. For glaucoma following discission the use of miotics postoperatively is recommended and preliminary use of atropine is warned against. Homatropine is sufficient if any preliminary mydriatic is employed. In spite of these precautions, secondary glaucoma will occur occasionally. In some cases it is a traumatic reaction to pulling on a tough band of membrane. The remedy for

this is a sharp dissection knife, employed to cut and not to tear the membrane. The glaucoma in most of these instances was discovered promptly, and it responded to the use of miotics, epinephrine and intravenous injections of dextrose.

Johns Hopkins Hospital Bulletin, Baltimore

66:71-138 (Feb.) 1940

- Effect of Stimulation on Fat and Carbohydrate Content of Gastrocnemius Muscle in the Phlorhizinized Rat. C. L. Gemmill, Baltimore.—p. 71.
Uses and Limitations of Soft Tissue Roentgenography in Placenta Praevia and in Certain Other Obstetric Conditions. W. H. Brown and A. L. Dippel, Baltimore.—p. 90.
Studies on Site of Sensitivity in Arthus Phenomenon. A. R. Rich and R. H. Follis Jr., Baltimore.—p. 106.
Eastern Variety of Rocky Mountain Spotted Fever: Experience on Adult Medical Service of the Johns Hopkins Hospital, Including Report of Fatal Case Showing Thrombocytopenia. A. L. Florman and J. Hafkenschiel, Baltimore.—p. 123.

Journal of Nutrition, Philadelphia

19:105-212 (Feb.) 1940. Partial Index

- Chronic Selenium Poisoning of Rats as Influenced by Dietary Protein. R. A. Gortner Jr., Middletown, Conn.—p. 105.
Comparison of Utilization by Guinea Pigs of Equivalent Amounts of Ascorbic Acid (Vitamin C) in Lemon Juice and in Crystalline Form. E. N. Todhunter, R. C. Robbins, G. Ivey and W. Brewer, Pullman, Wash.—p. 113.
Comparison of Utilization by College Women of Equivalent Amounts of Ascorbic Acid (Vitamin C) in Red Raspberries and in Crystalline Form. E. N. Todhunter and Alva S. Fatzer, Pullman, Wash.—p. 121.
Iron Metabolism: I. Role of Calcium in Iron Assimilation. S. W. Kletzien, with technical assistance of K. W. Buchwald and L. Hudson, Buffalo.—p. 187.
Protein Content of Organs and Tissues at Different Levels of Protein Consumption. T. Addis, D. D. Lee, W. Lew and L. J. Poo, San Francisco.—p. 199.
Iron and Copper versus Liver in Treatment of Hemorrhagic Anemia in Dogs on Milk Diets. D. V. Frost, V. R. Potter, C. A. Elvehjem and E. B. Hart, Madison, Wis.—p. 207.

Journal of Pediatrics, St. Louis

16:1-138 (Jan.) 1940

- Subacute Pneumonia in Children. Edith M. Lincoln, C. H. Smith and T. W. Kirmse, New York.—p. 1.
Study of Virus Factor in Whooping Cough. J. M. Frawley, Fresno, Calif.—p. 18.
Production and Use of Hyperimmune Human Whooping Cough Serum. A. C. McGuinness, Philadelphia; W. L. Bradford, Rochester, N. Y., and Janet G. Armstrong, Philadelphia.—p. 21.
Comparative Study of Therapeutic Agents in Treatment of Pertussis. P. Cohen, M. Weichsel and J. H. Lapin, New York.—p. 30.
Syndrome of Hydromicrocephaly. J. E. McClelland, Cleveland.—p. 36.
Case Finding in Tuberculosis: Study of Group of Children with History of Known Contact. Lillian A. Gilbert, New York.—p. 52.
*Diet of Adolescent Girls, with Special Reference to Nutritional State and Dental Caries. Leona M. Bayer, San Francisco.—p. 56.
Gastrointestinal Allergy in Children: Clinical Reactions Resulting from Ingestion of Foods. J. H. Fries and J. Zizmor, Brooklyn.—p. 69.
Treatment of Rickets with Minimal Viosterol Dosage. A. deG. Smith and N. A. Owens, Washington, D. C.—p. 76.
Recovery from Salmonella (Panama) Meningitis in Infant Treated with Sulfapyridine. C. P. Katsampas and W. L. Bradford, Rochester, N. Y.—p. 79.
Ataxia Due to Bite of American Dog Tick (Dermacentor Variabilis Say). P. A. Mulherin, Augusta, Ga.—p. 86.
Psychologic Care of the Preschool Child. Ruth Morris Bakwin and H. Bakwin, New York.—p. 89.

Diet of Adolescent Girls and Dental Caries.—Bayer studied the diet histories of eighty adolescent girls mostly from "middle class families." The group is a normal urban public school sample. The diet histories are analyzed and related to nutritional status and dental caries. The facts for the study were obtained chiefly from examination in 1932, 1934 and 1938 when the girls were respectively 11.5, 13.5 and 17.5 years old. Analysis of the data permits the following conclusions: 1. The diets were generally poor, containing on the average only about two thirds of the recommended essentials. 2. The greatest deficiency was in vegetables, fruits, milk and whole cereals. 3. Although no definite correspondence could be demonstrated, the impression was that the deficiency in nutritionally desirable foods was largely made up by starches and sweets. Clinically, judged by photographs and graphs of body build, only about half of the girls could be considered as having optimal weight; the remainder were evenly divided between overweight and underweight. The girls with optimal weight showed a diet adequacy which was slightly superior to that of the others. Dental caries was evaluated by counting decayed, missing or filled permanent teeth. The counts rose from an average of

two diseased teeth at 11.5 years of age to an average of nine at 17.5 years of age. The range at the last examination was from zero to twenty-one decayed, missing or filled teeth. No statistical relationships between poor teeth and poor diet—either inadequate or high in starch and sweets—could be demonstrated. Probably no diets were consistently good enough to exert a protective influence. From a detailed case study considering constitution, care and diet it appeared likely that favorable diet had protected one set of natively good teeth, that unfavorable diet had contributed to the breakdown of another good set of teeth and that poor diet had played an incalculable part in the decay of three natively poor sets of teeth. If clinical benefit is to come from available nutritional knowledge, the public must be made cognizant of the details and values of an optimal diet.

Kentucky Medical Journal, Bowling Green

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- The Patient a Personality Not a Machine. J. H. Blackburn, Bowling Green.—p. 48.
Anemias of Infancy and Childhood. W. N. Lipscomb, Lexington.—p. 53.
Treatment of Varicose Veins and Ulcers of Lower Extremity. D. G. Miller Jr., Morgantown.—p. 58.
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Sulfapyridine: Its Indications, Pharmacology, Untoward Effects and Methods of Administration. J. M. Kinsman, Louisville.—p. 65.
Anemia as a Problem for the Obstetrician and Gynecologist. H. Gordon, Louisville.—p. 75.
Five Thousand Spinal Anesthetics. C. C. Howard, Glasgow.—p. 78.
Diagnosis and Treatment of Certain Types of Anemia. R. E. Hayes, Glasgow.—p. 79.
Management of Pneumonia in Small Urban Communities. W. R. Parks, Harlan.—p. 83.
Cancer of the Larynx as a Medical Problem. J. S. Bumgardner, Louisville.—p. 88.

Laryngoscope, St. Louis

50: 1-88 (Jan.) 1940

- Review of Tuberculosis in the Field of Otolaryngology. F. R. Spencer, Boulder, Colo.—p. 1.
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Id.: Ear, Nose and Throat Complications—Lower Respiratory. J. G. M. Bullock, New York.—p. 55.
Id.: Poliomyelitis. P. M. Stimson, New York.—p. 57.
Is the X-Ray Examination of Maxillary Sinus Superior to Simple Transillumination? R. Waldapfel, Grand Junction, Colo.—p. 63.
Studies of the Eighth Cranial Nerve of Man. A. T. Rasmussen, Minneapolis.—p. 67.

Minnesota Medicine, St. Paul

23: 73-148 (Feb.) 1940

- Some Observations on Boehler's Treatment of Fractures. B. S. Adams, Hibbing.—p. 73.
Tumors of Neuromyo-Arterial Glomus. F. T. Becker, Duluth.—p. 78.
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Inhibition Ileus. E. A. Heiberg, Fergus Falls.—p. 94.
Episiotomy: Description of New Instrument for Presuture Method. J. T. Leland, Herman.—p. 97.
Ocular Tuberculosis: Its Similarity to Leprosy. J. J. Prendergast, St. Paul.—p. 98.
Convulsions in Children While Under General Anesthesia: Report of Case. O. S. Wyatt, Minneapolis.—p. 101.
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New England Journal of Medicine, Boston

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- Thrombophlebitis and Its Pulmonary Complications. L. A. Conner, New York.—p. 125.
Extrophy of Bladder and Epispadias. W. E. Ladd and T. H. Lanman, Boston.—p. 130.
Tuberculosis of Pancreas: Report of Case. R. R. Little, Wallum Lake, R. I.—p. 135.
Pentothal: Anesthetic Agent of Choice for Reduction of Simple Fractures. P. S. Marcus, Boston.—p. 137.
Treatment of Atrophic Arthritis with Estrogenic Substance. A. Cohen, A. W. Dubbs and A. Myers, Philadelphia.—p. 140.
Fundamental Misconceptions Involving Clinical Pathology. W. T. Salter, Boston.—p. 143.

Estrogenic Substance in Atrophic Arthritis.—The similarity of climacteric symptoms with those of acute and chronic atrophic arthritis and the reports of cases of atrophic arthritis benefited by pregnancy led Cohen et al. to believe that estrogenic substance might have a place in the therapy of atrophic

arthritis. Seventeen cases of the atrophic and six of the mixed (atrophic and hypertrophic) type of arthritis were treated with large doses of estrogen. Twelve of the patients experienced a distinct improvement in joint symptoms, five of these being coincidentally relieved of symptoms of the menopause. Three patients noted some improvement and then relapsed. Seven patients noted no improvement, general or local, and one said she was worse. The duration of treatment ranged from one week to three months. The total dosage of estrogenic substance varied from 50,000 to 850,000 international units. Individual doses ranged from 10,000 to 100,000 international units. In the beginning the patient was given an intramuscular injection of 10,000 international units daily, and when improvement was noted the interval was changed to once weekly. If no improvement was noted the dose was increased gradually to 100,000 international units. After three or four such doses, if no change was noted, treatment was discontinued. Twelve young sufferers from atrophic arthritis (moderately advanced) without menstrual disturbances were used as a control. Each was given 50,000 international units of estrogenic substance daily for from one to three weeks. None showed any response. The authors believe that atrophic arthritis occurring concomitantly with the menopause was benefited in a sufficient percentage of cases to suggest that this form of therapy has a definite place in the treatment of this type of atrophic arthritis.

Northwest Medicine, Seattle

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- Oregon Plan: Providing Medical Care for Low-Wage Industrial Group. W. W. Baum, Salem, Ore.—p. 3.
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Physiology of Uterine Musculature in Pregnancy and Labor. A. C. Ivy, Chicago.—p. 16.
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Recurrent Hemolymphangioma Cavernosum Cutis. C. P. Larson and C. M. Lane, Fort Steilacoom, Wash.—p. 26.
Sarcoma of Breast. R. L. Johnsrud, Portland, Ore.—p. 27.

Pennsylvania Medical Journal, Harrisburg

43: 401-592 (Jan.) 1940

- Results of Radical Mastectomy in 5,026 Cases of Carcinoma of Breast. Various Clinical and Pathologic Factors Which Influence Prognosis. S. W. Harrington, Rochester, Minn.—p. 413.
Finding an American Way. N. B. Van Etten, New York.—p. 428.
Voluntary Insured Medical Service for Pennsylvania? L. H. Perry, Harrisburg.—p. 430.
Management of Ureteral Calculi. L. B. Greene and C. C. Altman, Philadelphia.—p. 438.
Some Observations on Diagnosis of Pneumonia in Childhood. N. M. Macneill, Philadelphia.—p. 443.
Treatment of Pneumonia in Children with Sulfapyridine. T. F. M. Scott, Philadelphia.—p. 445.
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Liquid Colloidal Aluminum Hydroxide in Treatment of Peptic Ulcer. C. R. Jones Jr., Pittsburgh.—p. 468.
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Changing Conception of Gallbladder Management. W. F. Gennett, York.—p. 477.
Diabetes: I. Diabetes Mortality in Pennsylvania. F. P. Sturges, Harrisburg, and B. C. Blaine, Pottsville.—p. 481.

Physiological Reviews, Baltimore

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Psychoanalytic Quarterly, Albany, N. Y.

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On a Form of Defense. S. Pfeifer, Budapest, Hungary.—p. 108.

Public Health Reports, Washington, D. C.

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- Community Economic Status and the Dental Problem of School Children. H. Klein and C. E. Palmer.—p. 187.
Burrowing Owl as Host to Argasid Tick, Ornithodoros Parkeri. W. L. Jellison.—p. 206.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

48: 1-62 (Jan.) 1940

- Some Fundamentals of Endocrinology in Obstetrics and Gynecology. E. Allen, Chicago.—p. 1.
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Modes of Extension in Pelvic Infections: Appreciation of Their Significance on Prognosis. J. R. Goodall, Montreal.—p. 26.
Surgical Abdominal Complications of Pregnancy. L. E. Phaneuf, Boston.—p. 31.
Herniaphroditism and Sex Determination. J. P. Greenhill and H. E. Schmitz, Chicago.—p. 36.
Experimental Study of Nylon as Suture Material: Preliminary Report. H. M. Nichols and A. W. Diack, Portland, Ore.—p. 42.
Giant Cell Tumors of Patella. V. Richards, A. F. Giberson and D. King, San Francisco.—p. 47.
*Value of Blood Iodine Estimations in Diagnosis of Borderline Hyperthyroidism. H. J. Perkin and R. B. Cattell, Boston.—p. 50.
Electrosurgical Thyroidectomy. A. S. Jackson, Madison, Wis.—p. 54.

Blood Iodine Estimations and Borderline Hyperthyroidism.—For the purpose of ascertaining the significance of blood iodine estimations in the diagnosis of borderline hyperthyroidism, Perkin and Cattell correlated the clinical observations on 235 patients having goiter and questionable hyperthyroidism with the blood iodine level and the basal metabolic rate. The final clinical diagnoses studied represented the consensus of several clinicians. The patients were hospitalized for study. Determinations of the basal metabolic rate and of the blood iodine level were carried out under carefully controlled conditions. Multiple estimations were done in more than 35 per cent of the cases. The results showed that the amount of iodine in the blood is a better criterion in the differential diagnosis of thyrotoxicosis than the basal metabolic rate. This deduction was apparent from the groups of patients who were discharged because the clinical observations did not support a diagnosis of mild hyperthyroidism. However, the possibility of a mild hyperthyroidism being present in a small percentage of those discharged cases should be considered. In the patients with one or more adenomas within the thyroid, establishing a diagnosis of mild hyperthyroidism was not of primary importance except in making it possible to foretell the signs and symptoms that may be relieved following subtotal thyroidectomy. Nevertheless the estimation of the level of iodine in the blood of these patients with adenomatous goiters and questionable hyperthyroidism appeared preferable to the basal metabolic rate in recognizing the presence of an associated thyrotoxicosis. The value of blood iodine determinations in establishing a diagnosis of exophthalmic goiter in such cases is of the greatest significance, as it is essential to diagnose primary hyperthyroidism (exophthalmic goiter) before subtotal thyroidectomy is justified. The blood iodine of the patients followed up after operation substantiated the value of blood iodine estimations in the diagnosis of borderline hyperthyroidism. If the level of iodine in the blood is considered an index of the amount of secretion by the thyroid, the lack of clinical improvement in certain cases is readily explained by the blood iodine results which show no alteration following operation. The relative decrease in the level of iodine in the blood of patients following subtotal thyroidectomy lends support to the view that an increased thyroid secretion was present in these cases concomitant with clinical hyperthyroidism.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 41-78 (Jan. 13) 1940

- Pulmonary Circulation Before and After Harvey. R. A. Young.—p. 41.
Notes on Penetrating Chest Wounds. F. G. Thomson.—p. 44.
Treatment with Sulfapyridine of Guinea Pigs Infected with Brucella Abortus. G. S. Wilson and Irene Maier.—p. 47.
Platelet Reducing Extracts of Spleen. Felicity C. G. Hobson and L. J. Witts.—p. 50.
Treatment of Infected Burns. B. C. Murless.—p. 51.

Lancet, London

1: 61-108 (Jan. 13) 1940

- Cardiac Decompression by Mobilizing Chest Wall. L. O'Shaughnessy.—p. 61.
*Blood Cultures and Selection of Mediums. J. B. Penfold, J. Goldman and R. W. Fairbrother.—p. 65.
Cholecystocholedochostomy: Attempt to Preserve a Functioning Gall-bladder When Operating. B. O. C. Pribram.—p. 68.
*Observations on Coagulation of Blood Plasma in Hemophilia. H. Dam and H. Vennedt.—p. 70.
Enteric Intussusception Treated by Resection. F. Forty.—p. 72.
Urinary Excretion of Porphyrins in Chemical Workers. C. Rimington and M. W. Goldblatt.—p. 73.

Blood Cultures and the Selection of Mediums.—Penfold and his collaborators point out that bacteremia is common in the acute stages of many infections, and blood culture is consequently an important diagnostic procedure. Many types of organisms may be isolated in this way, and, since they may vary considerably in nutritional requirements, the selection of mediums for routine purposes is important. The authors decided to examine the relative value of various mediums under standard conditions to determine the most satisfactory series for routine investigations. They describe their method for the routine collection of the blood so as to avoid contamination and then take up the preparation of the mediums. Further, they report the results of 160 routine blood cultures and the results of experimental blood cultures. They found that, to obtain the most satisfactory results from blood cultures, two important factors have to be considered: attention to strict asepsis and the use of a wide range of mediums. Failure to observe strict asepsis almost invariably leads to contamination. The use of several mediums increases the risk of air-borne contamination owing to the longer time required to seed the various mediums and, since cultures often have to be collected in busy wards, this risk should not be ignored. Recent work has confirmed the view that simple mediums alone are unreliable for blood cultures, but it is obviously impossible in routine work to use every type of medium recommended for this purpose. The selection of a convenient range is therefore important. Care should be taken to include all mediums that offer special advantages for organisms likely to be cultivated. Results obtained from routine and experimental blood cultures indicate that a convenient range of mediums for routine work consists of saponin broth, dextrose trypsin broth, Hartley's broth and Robertson's meat medium, the two former being added to agar to give a solid medium. No evidence was obtained that the addition of a liquid medium offered any further advantages.

Coagulation of Blood Plasma in Hemophilia.—Dam and Vennedt say that in earlier investigations on the clotting power of human and mammalian blood they used a method of determination in which blood plasma containing a certain quantity of heparin was tested against various concentrations of an extract of human brain. In this method 0.03 mg. of the standard heparin of Jorpes is added to 4 cc. of blood, and the concentration (K) of the brain extract which coagulates the plasma in three minutes under fixed conditions is determined. If the corresponding concentration of the brain extract which coagulates normal plasma with the same concentration of heparin in three minutes is K_n , the equation $R = \frac{K}{K_n}$ gives the measure of the abnormality of the coagulation, and the equation $\frac{1}{R} = \frac{K_n}{K}$ gives the clotting power. Plasma with normal clotting power has an R value equal to 1. In plasma from hemophilic patients the clotting power ($\frac{1}{R}$) is normal (approximately 1); but when certain variations of the technic are introduced, the ability of hemo-

philic plasma to react with tissue extract is reduced. Summarizing their observations they say that the abnormal coagulation of hemophilic plasma can be defined as due to a reduced ability of the plasma to coagulate in the presence of small quantities of tissue extract, such as are usually liberated from mechanically damaged cells, whereas there is no difference between hemophilic and normal plasma in respect of the clotting power in the presence of large quantities of tissue extract. When platelet suspensions are used instead of tissue extract, the difference in coagulation power between normal and hemophilic plasma is even more pronounced.

1: 109-156 (Jan. 20) 1940

- Sources of Hemolytic Streptococcus Infection of Wounds in War and in Civil Life. R. Hare.—p. 109.
 *Effects of Storage on Human Erythrocytes. M. Maizels and N. Whittaker.—p. 113.
 Sympathomimetic Drugs. R. L. Osborne.—p. 116.
 Nervous Complications of Weil's Disease. V. Mortensen.—p. 117.
 Herniation of Stomach with Anemia. S. C. Dyke and G. E. Dyas.—p. 119.
 Simple Apparatus for Constant Suction. H. L. Marriott and A. F. Foster-Carter.—p. 122.
 Central Nervous System in Congenital Absence of One Leg. E. W. Walls.—p. 123.

Storage of Human Erythrocytes.—According to Maizels and Whittaker it is to be expected that a system like blood, consisting of complex organic substances liable to degradation and containing active ferments, will show many changes under the conditions of storage necessitated by modern warfare. The authors say that when fresh blood is mixed with a 1.05 per cent solution of sodium citrate and 0.85 per cent solution of sodium chloride there is an initial decrease in volume, because the anticoagulant is hypertonic. Thereafter the cells lose their impermeability to salts, swell and finally undergo hemolysis. These changes may be checked and the blood preserved by the addition of dextrin. Dextrin acts by liberating dextrose, which, on the one hand, delays penetration of salts and so checks the swelling of the cells and, on the other hand, increases the surface area of the cell membrane so that it can tolerate a larger absolute inflow of fluid than can the normal cell. Very little ammonia is liberated in stored blood. Hydrolysis of organic phosphate within the cell is slow. At the storage temperature of from 2 to 4 C. significant amounts of inorganic phosphate appear only after a week's storage. Escape of inorganic phosphate from the cell into the surrounding citrate plasma is slow; an obvious leakage is apparent only after two weeks' storage. Incubation for one and one half hours at 37 C. of blood stored at 2 C. causes a great increase in intracellular hydrolysis of phosphoric esters and in extracellular leakage of inorganic phosphate.

Medical Journal of Australia, Sydney

1: 1-36 (Jan. 6) 1940

- Short Wave Therapy. L. T. Wedlick.—p. 9.
 Acholuric Jaundice: Report of Case. B. T. Shallard.—p. 12.

1: 37-70 (Jan. 13) 1940

- History of Some Fundamental Contributions of Biology to Medicine: Cell Theory and Sexual Reproduction. W. J. Dakin.—p. 37.
 Occurrence of Broad Fish Tapeworm of Man and Carnivores in Dogs in Australia. H. M. Gordon.—p. 47.

Practitioner, London

1: 4: 1-108 (Jan.) 1940

- *Use and Abuse of Chemotherapeutic Agents of Sulfonamide Group: Introduction. L. E. H. Whitty.—p. 1.
 Nomenclature of Modern Chemotherapeutic Drugs. W. K. Fitch.—p. 5.
 Uses and Abuses of Chemotherapy in Streptococcal Diseases. W. R. Snodgrass.—p. 16.
 Modern Chemotherapy and Meningococcal Infections. F. G. Hobson.—p. 25.
 Modern Chemotherapy and Pneumococcal Infections. W. F. Gaisford.—p. 33.
 Modern Chemotherapy and Gonococcal Infections. V. E. Lloyd.—p. 44.
 Chemotherapy and Acute Specific Fevers. A. R. Thompson.—p. 52.
 Affections of the Heart in Time of War. R. O. Moon.—p. 61.
 Swellings and Sinuses in Neck in Childhood. C. Donald.—p. 66.
 Indications for and Technique of Whole Blood Injections. C. Hardwick.—p. 79.
 Modern Therapeutics: VII. Metallic Compounds. G. M. Findlay.—p. 83.

Use and Abuse of Sulfonamide Derivatives.—Whitty states that beta hemolytic streptococci, pneumococci, *Bacillus coli*, meningococci and gonococci are the organisms that need to be considered in relation to treatment with sulfonamide deriva-

tives. It is essential to maintain an effective concentration of the drug in the blood. Because the drugs are quickly excreted, night doses must not be omitted; otherwise the blood concentration falls below the effective level. If the drugs are going to be effective they quickly show some evidence of this. Therefore if no clinical effect is observed in from five to seven days there is no justification for prolonging an adequate course of a particular sulfonamide derivative beyond this period. But if a clinical effect has been observed its administration should be continued for from ten to fourteen days. If not completely effective at the end of this time, a rest period of two days should be given and a fresh course then instituted. Continuous prolonged courses are likely to produce serious complications, one of which is granulocytopenia. When a full clinical effect has been obtained it is wise to give small doses for a further two days in order to prevent a recrudescence of the infection. These drugs have no effect on filter-passing viruses such as the influenza virus, but they are invaluable in the treatment of secondary coccid infections, which are relatively common complications of the primary disease. Routine administration of the sulfonamide derivatives in simple cases of influenza is unwise. The administration of small doses of these drugs in any suspected case of influenza with the idea of avoiding secondary infection is to be avoided. The usual dose administered is quite ineffective and this practice of toying with a powerful remedy probably constitutes one of its biggest abuses. When used at all the drugs should be given in full doses; otherwise no deductions can be made as to effectiveness. Rather than administer small doses on chance, it is preferable to withhold the drug until there is some justification for giving full clinically effective doses.

South African Medical Journal, Cape Town

13: 795-816 (Dec. 23) 1939

- Importance of Correct Dosage in Heliotherapy. J. Grober.—p. 793.
 Helminthologic Notes from Zululand. B. de Meillon and E. Hellard.—p. 798.
 Murine Typhus in Natal: I. Report of Occurrence of Case. M. Maister and A. Miller.—p. 803.
 Id.: II. Laboratory Investigations. J. Gear and B. de Meillon.—p. 811.
 Two Interesting South African Typhoid Outbreaks. B. M. Clark.—p. 806.
 Harpactirella Lightfooti as Cause of Spider Bite in the Union. M. H. Finlayson, with biologic note by R. Smithers.—p. 808.
 Role of Extracardiac Arteries in Myocardial Circulation (Résumé). M. Correia.—p. 811.
 Surgical Tuberculosis Among Non-Europeans at Johannesburg. G. T. du Toit.—p. 812.
 *The Common Dog Tick Haemaphysalis Leachi as Vector of Tick Typhus. J. Gear and B. de Meillon.—p. 815.

Dog Tick as Vector of Tick Typhus.—Gear and de Meillon describe experiments which prove that the dog tick *Haemaphysalis leachi* harbors *Rickettsia* morphologically and immunologically identical with those causing tick-bite fever. It was also found that the tick *Haemaphysalis leachi* was capable of transmitting the infection while biting and feeding on guinea pigs. At necropsy these guinea pigs showed a fairly typical appearance. The lymph glands, especially the inguinal glands, were moderately enlarged and frequently showed focal hemorrhages. The tunica vaginalis was congested and showed scattered hemorrhagic areas which appear to be more discrete and larger than those occurring in murine typhus infections. Later in the disease a fibrinous exudate covering the tunica was found. The spleen was not as large as in most instances of murine infection and showed a rough surface which was or was not partially covered with a fibrinous exudate. Cross-immunity tests to determine the immunologic relationship of this strain revealed that guinea pigs which had recovered from an attack of tick-bite fever were found to be immune to inoculation with this strain and guinea pigs which had recovered from the infection with this strain were found to be immune to tick-bite fever. From a study of the immunologic relationship of this strain to human and murine typhus it was found that there was no cross protection in either case; thus guinea pigs which recovered from epidemic typhus when inoculated with this virus had typical attacks of fever associated with the characteristic scrotal swelling. Similarly, guinea pigs recovering from murine typhus also reacted in typical fashion when inoculated with this strain. But guinea pigs recovered from the infection of this tick strain when inoculated with the virus of epidemic or of murine typhus, were found to be susceptible.

Lyon Chirurgial, Paris

36: 513-643 (No. 5) 1939-1940

Typhoid and Paratyphoid Suppurations of Ovarian Cysts. C. Dunet and M. Dargent.—p. 513.

Anatomic Investigations on Connections of Floor of Mouth and of Submaxillary Cavity with Face: Pathogenesis of Diffuse Facial Phlegmons Following Ludwig's Angina. G. Goufas.—p. 536.

*Surgical Anastomosis in Cholelithiasis. G. Redell.—p. 550.

Value of Sympathectomy at Distance in Certain Operations for Arteriovenous Aneurysm. T. Plotkin.—p. 563.

Surgical Anastomosis in Cholelithiasis.—Redell describes anastomosis in cholelithiasis in seventy-six cases of choledocholithiasis. He concludes that: 1. Surgical anastomosis can never replace the removal of the calculus. Calculi left behind, especially those below the anastomosis, always involve a risk. 2. The chief indication for anastomosis is the possibility of persistent calculi in the hepatic ducts or stricture of the inferior end of the choledochus due to a calculus. 3. If the condition of the patient does not permit immediate removal of the calculus, the bile must be diverted. There are facts which speak in favor of a diversion toward the intestine by means of an anastomosis rather than toward the outside by a drain. 4. The effect of the anastomosis is the better and the risks are the lesser, if the anastomosis is made as large as possible. The anastomosis of the choledochus (or of the hepatic duct) is preferable to that of the gallbladder, in which the small lumen of the cystic duct is an inconvenience. 5. The danger of ascending angiocholitis is so small that it hardly limits the indications for anastomosis.

Presse Médicale, Paris

48: 1-24 (Jan. 3-6) 1940

Treatment of Muscular Wounds Due to War Projectiles. R. Leriche.—p. 1.

Our Anesthetic Resources. E. Desmarest.—p. 4.

Barbers' Dermatoses. A. Tzanck and E. Sidi.—p. 5.

*Contribution to Study of Right Symptomatic Pleurisy Due to Amebic Abscess of Liver. C. Anagnostopoulos.—p. 7.

Pleurisy Due to Amebic Abscess of Liver.—Anagnostopoulos points out the serious character of right symptomatic pleurisy due to amebic abscess of the liver. Clinical experience shows that the lack of characteristic symptoms and the inadequacy of x-ray diagnosis and laboratory observations hinder correct diagnosis. An epidemic or endemic of amebic dysentery and the presence of amebic elements in the stool of the patient should direct the attention to a possibility of amebic hepatic abscess. The finding of a painful area at the last intercostal region and puncture of the liver will complete the diagnosis. Treatment of the hepatic abscess takes care of the symptomatic pleurisy and only the purulent forms need particular attention.

Revue Belge des Sciences Médicales, Louvain

11: 337-420 (Oct.) 1940

*Hematologic Investigations on Medullary Biopsy. W. De Weerd.—p. 337.

11: 421-492 (Nov.) 1940

*Role of Intoxication in High Intestinal Obstruction: Its Demonstration by Blood Transfusion and Crossed Circulation. J. Bottin.—p. 421.

*Hematologic Investigations on Medullary Biopsy. W. De Weerd.—p. 440.

Hematologic Investigations on Medullary Biopsy.—De Weerd presents an extensive study on biopsy of the bone marrow by means of sternal puncture. To avoid dilution of the medullary substance by blood it is desirable to reduce aspiration to a minimum. To be complete, the interpretation of the myelogram must allow of the establishment of the granulo-erythropoietic ratio, the maturation curve of erythroblasts and of the granular elements, the determination of the index of protoplasmic maturation of the erythroblasts and the determination of the karyokinetic index. It is difficult to determine the exact number of the megakaryocytes because of their uneven distribution; however, their morphologic study cannot be dispensed with. Orthochromatic normoblasts are rare in the normal marrow. It is necessary to differentiate among the cells corresponding to the morphologic type of the myeloblast of Naegeli, a peroxydase-negative hemocytoblast and a peroxydase-positive myeloblast. Certain myeloblasts with azurophil granules, occurring in the normal marrow, possess a polymorphous nucleus. Some myelocytes and promyelocytes present an intense vacuolization. The megakaryocytes of the normal marrow are formed by hypertrophy of the lymphoid cells and not by fusion of several

elements. There exist in the normal marrow transitions between the reticular cells and the monocytes. The normal marrow contains lymphocytes of histoid origin distinct from the reticular lymphoid cells of Rohr. The "plasmocytes" of the marrow are of reticulo-endothelial origin. Diverse types of cells observed by Ferrata in leukemic blood are the result of the flattening of the fragile parenchymatous cells. In hemolytic icterus the erythropoietic hyperplasia is of the pure normoblastic type. In posthemorrhagic anemia the index of cytoplasmic maturation of erythroblasts may be notably augmented, the same as the karyokinetic index. In lead anemia the marrow contains more erythroblasts with basophil granules and more stippled erythrocytes than does the blood. The majority of nonmegaloblastic hyperchromic anemias present a greatly increased index of cytoplasmic maturation of erythroblasts and in addition there are often found erythroblasts of a morphology intermediate between that of a normoblast and a megaloblast. Certain neuro-anemias with achylia but without megaloblastosis, which respond to liver therapy, must be connected with Biermer's disease. The megaloblastosis that characterizes pernicious anemia disappears rapidly under liver therapy. The index of cytoplasmic maturation of erythroblasts in pernicious anemia is the highest ever encountered by the author. The maturation of granulocytes is likewise disturbed in pernicious anemia. The aplastic anemias can be divided into three groups, depending on whether they possess a granulo-erythropoietic ratio that is equal, inferior or superior to the normal. In acute leukemia the study of the bone marrow shows the relationship of the acute myeloses and of the leukemias with hemocytoblasts. The leukemia with monocytes cannot be considered as a pure reticulo-endotheliosis; it is an acute myelosis with associated reticulosis. In the acute leukemias there exist considerable disturbances in the maturation of erythroblasts. In Werlhof's disease the megakaryocytes present disturbances of maturation, whereas in Schönlein-Henoch's disease the megakaryocytic system seems to be intact. In Hodgkin's disease the sternal puncture did not reveal Sternberg's cells, but it did reveal frequently a medullary eosinophilia, which may exist in the absence of eosinophilia in the blood. In the majority of cases of mycosis fungoides the marrow presents a polymorphous histoid reaction; the eosinophilia is inconstant. In the advanced stage disturbances in the maturation of erythroblasts and of the granulocytes take place.

Intoxication in High Intestinal Obstruction.—Review of the literature on the causes of death or of the severe complications in high intestinal obstruction, according to Bottin, reveals that dehydration is an essential factor. There exists, however, another factor of equal significance which assumes the character of an intoxication. The methods of crossed circulation and of blood transfusion in experimental high intestinal obstruction in animals enabled the author to demonstrate the existence of the two essential factors of the grave consequences of high intestinal obstruction, intoxication and dehydration. The chief source of intoxication is to be seen in the discrete parenchymatous lesions of the pancreas as well as in other accessory foci, such as the obstructed loop and perhaps the liver; but the latter source is not certain.

Gastroenterologia, Basel

64: 259-382 (Nov.) 1940. Partial Index

Benign Ulcers, Transformed Ulcers and Ulceriform Cancers. R. A. Gutmann.—p. 259.

Clinical Demonstrations of a Series of Disorders of Esophagus. M. Michaud.—p. 263.

Peptic Ulcer. J. H. Oltramare.—p. 267.

Benign Ulcer of Large Curvature with Neoplastic Aspect. M. Demole and G. Henny.—p. 282.

Pyloric Carcinoma with Deceiving Roentgenologic Aspects: Picture of Duodenal Ulcer. C. Gross.—p. 286.

Duodenal Ulcer After Burns and After Lead Poisoning. H. Kapp.—p. 290.

New Remarks on Invaginations. G. Piotet.—p. 299.

*Influence of Pancreatic Tumors on Renal Function. W. Markert.—p. 324.

Investigations on Pathology of Fructose Metabolism. H. Steinitz.—p. 334.

Influence of Pancreatic Tumors on Renal Function.—According to Markert, the diagnosis of pancreatic tumors is generally difficult, not only because of the location of the organ, but also because in the case of a localized tumor the remaining pancreatic parenchyma may function adequately. Tumors of the body and tail are even more difficult to detect than those of the head of the organ, because their location under the left costal arch may simulate a neoplasm of the left kidney, the more so

since tumors of these portions of the pancreas cause secretory disturbances of the left kidney. The author describes two cases in which the secretory function of the left kidney was impaired. Intravenous injection of indigo carmine revealed that, in comparison with the right kidney, the left presented delayed elimination of the dyestuff. Secretion of urine, urea and chlorides was diminished and microscopic hematuria was present. This impairment of the secretory function of the left kidney was not caused by changes in the organ itself but was due to the irritating action exerted on the renal fibers or ganglions by carcinomatous enlargement of the pancreatic gland. The author states that of six cases of neoplasm of the tail of the pancreas detected at the institute of pathologic anatomy in Warsaw three had been diagnosed during life as cancer of the kidney. Such diagnostic errors may lead to erroneous treatment.

Chirurgia degli Organi d. Movimento, Bologna

25: 149-286 (Dec.) 1939

*Embolism of Pulmonary Artery from Trauma. C. A. Zucchi.—p. 153.
Arthritis of Vertebral Apophysis in Course of Tuberculous Spondylitis. D. Logrosino.—p. 165.

Embolism of Pulmonary Artery from Trauma.—In the Istituto Rizzoli, from 1929 to 1938, Zucchi observed fourteen cases of embolism of the pulmonary artery from fractures or else orthopedic operations on the lower extremities. In all cases there was no doubt with regard to the relations between fractures or surgical trauma and pulmonary embolism, which developed within four to twenty days and more frequently within fifteen days after trauma. The symptoms were sudden in eleven cases. Symptoms of thrombosis in two cases and of pulmonary infarction in two cases appeared several days before those of pulmonary embolism. In preventing pulmonary embolism the author advises, whenever possible, avoidance of operations in the elderly as well as among diabetic patients and in the presence of heart disease with slight decompensation. He advises also the removal of varicose veins before performing operation on the lower extremities, early reduction and immobilization of fractures and the proper treatment of thrombosis which may appear before pulmonary embolism. As actual treatment, early administration of cardiokinetic drugs is indicated. Bleeding and inhalation of oxygen are indicated in the presence of acute cyanosis. The patient is kept in complete rest and given morphine to have pain and anxiety under control. The surgeon has to be ready to perform embolectomy by proper indications at any moment.

Medizinische Welt, Berlin

13: 1617-1628 (Dec. 30) 1939

War Injuries of Eye. C. Behr.—p. 1617.
*Endocrine Therapy in Vechterew's Disease. A. H. Lemmerz and O. Köddermann.—p. 1621.

Endocrine Therapy in Spondylitis Deformans.—Lemmerz and Köddermann report the results of the therapy which they employed in forty-five cases of spondylitis deformans. Testosterone propionate and an extract of the anterior lobe of the hypophysis were administered in alternate doses of respectively 5 mg. and 100 mouse units. Twenty-eight cases were treated in this manner, the other seventeen by combined endocrine and roentgen therapy. Judged by the criteria of improvements in chest breathing, sedimentation rate and general physical mobility, twenty-two of the twenty-eight showed considerable thoracic breathing expansion, in part as much as 6.5 cm.; twenty were favorably affected in their erythrocytic reaction, several attaining normal levels, and in all, save one, physical mobility was enhanced. All of the seventeen patients given the combined therapy were benefited in physical mobility and fourteen in chest breathing. The sedimentation test, however, was widely divergent. The authors accept the view that spondylitis deformans is a vertebral disease of an inflammatory nature in which endocrine dysfunction is present but the evolution of which is governed by a focal toxicosis that can be demonstrated clinically and serologically in every case. They attribute the divergence of results, in this practically sex-limited disease, to varying conditions of humoral dyscrasia in which testicular hypofunction can be determined as well as hypophysial intoxication, necessitating difference in treatment. Patients presenting dental and tonsillar foci, they say, can be

expected to react differently to the sedimentation test from those with abnormalities in the accessory nasal cavities. According to the authors, the early stages of the disease require intensive clinical, roentgenologic and serologic examinations. They conclude that further studies need to be made of metabolic and capillary functioning before endocrine therapy can be used as a definite instrument of medication for this disease.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

84: 1-132 (Jan. 6) 1940. Partial Index

Nutrition During War Time. B. C. P. Jansen.—p. 5.
Lentiginosis Profusa: Case. C. H. Beek.—p. 8.
Influenza Epidemic of February and March 1939 in Garrison of Groningen: I. Epidemiologic and Clinical Aspects. J. Mulder, L. J. Zielstra and J. Boer.—p. 11.
*Sterile Pyuria. H. C. E. M. Houtappel.—p. 19.
Treatment with Vitamin B₁. J. Goudsmit.—p. 25.

Sterile Pyuria.—Houtappel points out the existence of cases in which urinary sediment contains leukocytes but in which cultures on various mediums fail to reveal bacteria. This often signifies urogenital tuberculosis, but a number of authors (Söderlund and others) have demonstrated that in some of these there exists a sharply defined disorder, which is not tuberculous and which has a favorable prognosis. The author presents the clinical histories of two patients with a "genuine sterile pyuria." The etiology of the condition is not clear. The disorder is found chiefly in young males. The course is often chronic, extending over months or years. There are frequently a mild albuminuria and a few hyaline casts. Hematuria (microscopic or macroscopic) is always present. Cystoscopy discloses a greatly reduced bladder capacity and a diffuse inflammation of the vesical mucosa. The renal function is good or only slightly impaired. The differential diagnosis must exclude tuberculosis and calculi. Conservative therapy of ordinary cystitis is generally of no avail, but intravenous injections of neoarsphenamine have a specific effect. Subjective improvement is noticeable after the first injection, and the second or third injection generally effects a cure. Occasionally a second series of injections becomes necessary. An important factor in the treatment is the removal of foci of infection (infected teeth, tonsils and so on).

Acta Radiologica, Stockholm

20: 521-638 (Dec. 31) 1939. Partial Index

Sedimentation of Oil by Myelography and Its Diagnostic Significance. F. Knutsson.—p. 537.
*Arthrography and Roentgenography in Ruptures of Tendons of Shoulder Joint. K. Lindblom.—p. 548.
Pathogenesis of Ruptures of Tendon Aponeurosis of Shoulder Joint. K. Lindblom.—p. 563.
Spontaneous Gas Pyelogram. O. Olsson.—p. 578.
Roentgenologic Diagnosis of Sideropenic Dysphagia: Plummer-Vinson's Syndrome. J. Waldenström and S. R. Kjellberg.—p. 618.

Arthrography in Rupture of Tendons of Shoulder.—Lindblom and Palmer have employed an arthrographic method in the diagnosis of the rupture of tendons in the shoulder joint. The technic is as follows: The patient lies on his back with the arm adducted and relaxed. A hypodermic needle 1 mm. in diameter is inserted about 1 cm. ventrolateral to the acromioclavicular joint in the direction of the center of the head of the humerus. The point of the needle pierces the cutis, subcutis, fascia, deltoid muscle, subacromial bursa, tendon aponeurosis, joint space and articular cartilage until it meets bony resistance. The patient is now instructed to relax completely, and attempts to inject procaine hydrochloride are made. Six cubic centimeters of contrast medium mixed with 1 cc. of procaine hydrochloride is now injected, with the patient still relaxed. The needle is removed immediately, and a number of passive movements of the arm are made, in order to spread the contrast medium throughout the joint. The roentgenograms are taken without delay, since the contrast medium becomes rapidly absorbed. Lindblom describes the arthrograms of normal cases and of the ruptures of the supraspinatus and infraspinatus portions of the tendon aponeurosis, ruptures of the subscapularis portion of the tendon aponeurosis and those of the long biceps tendon, as well as other roentgenologic changes in ruptures of the tendon aponeurosis. He states that a comparison with the clinical symptoms and the ordinary roentgenologic signs illustrates the great superiority of arthrography in arriving at a correct diagnosis.

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WHEN SHOULD ONE OPERATE FOR "CHRONIC APPENDICITIS"?

A STUDY OF 385 CASES

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The busy consultant is constantly being called on to help decide whether or not in a given case a certain operation should be performed. Every one knows that this operation works miracles of healing in some cases, but would it do so in the particular one? Often the consultant can only guess and sometimes, of course, being human and fallible, he must guess wrong. From time to time he will hear that some woman who disregarded his advice and went ahead with an operation for which he could see no indications promptly got well, and then he will wonder whether the patient was really cured and if so whether the surgeon who operated was an unusually wise and discerning man or was just lucky. Did he take a long history and from this decide that here was one frail psychopathic woman who could be helped by a laparotomy, or did he operate simply because that was his usual way of handling puzzling cases? Was it his custom to operate on many persons in order to cure a few? Obviously, one can work an occasional miracle in this way; but is not the man who saves forty-nine patients from fruitless operations while failing to help one a much better physician and public servant than is he who operates fruitlessly on forty-nine in order to cure one?

Unfortunately, today, for lack of statistical information, the consultant must base many of his decisions on "hunches" or on a mental summing up of vague pros and cons. How much better and more exact our science would be if we physicians could say to a particular patient "Statistics show that in a case like yours there is only one chance in a hundred that an appendectomy would help. If you are desperate enough to take such long odds, or if by temperament you are a gambler, you can choose to be operated on. I cannot advise you to take such chances because always I must tell my patients what I believe is the wisest and safest course and the one most likely to lead to renewed health." If, then, with the unfavorable odds before him, an individual should choose to gamble and should win, he couldn't logically heap abuse on the sensible clinician who cautioned him and heap praise on the highly optimistic surgeon who operated; he could only congratulate himself on being lucky.

METHOD OF STUDY

Following this line of thought, I several years ago opened a note book in which I gathered data to help me in deciding when and when not to recommend an

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interval appendectomy. Whenever I saw a patient with a scar in the right lower quadrant of the abdomen I asked why the operation was done, what were the symptoms complained of, were there any acute attacks of appendicitis, and what was the result obtained?

In all, I obtained information from 385 patients, seen consecutively and all operated on, not at this clinic, from three to thirty years ago. There were about equal numbers of men and women.¹ Toward the end of the paper I will comment on a few cases in which I learned much by my own mistakes. What usually happened was that I failed to elicit or to interpret properly the history of one or more mild or atypical attacks of appendicitis, and as a result some one else had to order the operation and cure the patient.

WHAT DETERMINES SUCCESS OR FAILURE

I had not accumulated many records before it became apparent what the important point in the patient's history was. Evidently there was one simple question the answer to which could immediately have told the surgeon whether or not he would be justified in operating for "chronic appendicitis." This question was: Did the patient ever have one or more attacks of abdominal pain around the navel or in the right lower quadrant, pain severe enough to put him to bed, to keep him awake much of the night and to cause the attending physician to diagnose or greatly suspect the presence of acute appendicitis? In most of the cases in which, after one or more such attacks, a young man or woman suffered with indigestion, nausea, loss of appetite, abdominal discomfort, toxic feelings, occasional cramps and a loss of energy and joy of life, appendectomy worked a decided cure. On the other hand, in almost every case in which there was no history suggesting a previous acute attack of appendicitis, the operation was fruitless.

I know that this has been the experience of most able clinicians and surgeons, but I think any one who will look over the brief records given here of patients operated on in these United States will agree with me that there is still great need for showing the medical profession the almost complete hopelessness of performing appendectomy in cases in which no history can be obtained of acute attacks of abdominal pain. There is great need also for showing physicians that appendectomy can no longer be looked to as a cure for neuroses, fatigue states, "mucous colitis," constipation, diarrhea, migraine, duodenal ulcer, cholecystitis or regurgitation. Naturally, in the past there was need for investigation along these lines; but enough trials have been made and enough failures recorded so that further research would seem now to be unnecessary.

1. Unfortunately, at the beginning of this study I got tired of keeping notes of all those typical cases in which, in youth, there was an acute attack, a quick operation and a complete cure, or the number of these cases listed would have been much larger.

PART I. CASES IN WHICH THERE WAS NO
HISTORY OF ACUTE APPENDICITIS

Reasons for Performing the Operation and the Results Obtained.—There were 255 patients who could not remember ever having had an attack suggesting acute appendicitis. In table I I have listed the many conditions which physicians hoped that appendectomy would cure, or the best guess as to the condition then existing that can now be made.

A study of this table brought me several surprises. I had assumed that in this country the main reason for performing an interval appendectomy is pain and soreness in the right lower quadrant of the abdomen

TABLE 1.—*Diseases Which Appendectomy Was Expected to Help; Data from 255 Patients Who Gave No History of Acute Appendicitis**

Diseases	No. of Cases
Neurosis and nervousness.....	39
Constitutional inadequacy.....	32
Pseudo-appendicitis.....	25
Duodenal ulcer.....	24
Migraine and migraine equivalent.....	24
Psychopathic troubles.....	22
X-ray diagnosis of appendicitis.....	20
Functional and nervous diarrhea.....	17
Sensitive colon or "Mucous colitis".....	15
Nervous regurgitation.....	15
Cholecystitis.....	14
Spondylitis, fibrositis and myositis.....	13
Sore liver and pseudocholecystitis.....	12
Pseudo-ulcer, gastritis (?), heartburn.....	12
Vague indigestion or abdominal discomfort.....	11
Food sensitiveness and allergy.....	10
Flatulence, and bloating and belching.....	10
Nausea.....	7
Constipation.....	7
Renal colic.....	6
Toxic feelings.....	4
Polyglandular dysfunction.....	4
Pyelitis.....	3
Low grade fever (?).....	3
Patient insisted on it.....	3
Cerebral thrombosis (slight).....	2
Acute indigestion from overeating.....	2
Jaundice.....	1
Cataplexy.....	1
A stitch in the side.....	1
Epilepsy-like spells.....	1
Uterine leiomyomas.....	1
Tuberculosis of the cecum.....	1
Carcinoma of the ascending colon.....	1
Constant headache.....	1

* In some instances one case has been listed under several headings, as when a psychopathic, constitutionally inadequate girl suffered with a sensitive colon, migraine and constipation.

with some indigestion. Actually, in the group of 255 patients there were only twenty-five who were operated on because of this syndrome. Twenty were operated on for a roentgenologic diagnosis of appendicitis, which apparently was incorrect in every instance because none of the patients were helped by the removal of the organ. These observations support the opinion of some of the ablest roentgenologists in the country today who do not ever attempt, from their films, to make the diagnosis of a diseased appendix.

The most common reason given for the performance of the operation was that the patient and the surgeon hoped that it would bring quick relief from the distresses of constitutional inadequacy, a fatigue state, a nervous breakdown or a psychopathic makeup. At least two of the patients were occasionally insane. No one of the ninety-three patients in this group obtained permanent relief.

Curiously, the next most frequent reason given for having submitted to an interval appendectomy was that the attending physician hoped thereby to cure that group of symptoms which suggested or indicated the presence of a peptic ulcer. There were thirty-six cases of this type, and in twenty-four a duodenal ulcer was demonstrated roentgenologically either before the operation or after it. In a number of cases, after the surgeon was told that an ulcer was present he went ahead and removed the appendix through a McBurney incision. In some instances he told the patient that he was acting on the old theory that chronic infection in the appendix can start an ulcer going and can keep it active. In a few other cases the operator was frank enough to admit that he would rather try the effect of appendectomy first because his mortality rate for gastro-enterostomy was a bit high. One of the patients, an opinionated business man, when told that he had an ulcer, refused to diet and ordered his family doctor to operate on him. Rather than argue with him, the physician wisely did only what he felt capable of doing.

The failure to effect a cure in any of the twenty-four cases of ulcer should, I think, convince every one that appendectomy can no longer be regarded as a treatment for ulcer. As one might have expected, following the rest in bed and the usual short vacation from business, several patients obtained a remission; but others failed to get any such relief, and a few were worse. Only one of the twelve patients operated on for pseudo-ulcer and heartburn was rewarded with lasting relief.

As Barber and Mayo² have shown, there is a group of patients with a syndrome suggesting cholecystitis or duodenal ulcer who can be cured by appendectomy; but, as they emphasize, this group must be chosen with great care and after much study. The patient's history must suggest strongly that he has organic disease of the digestive tract, and finally, when the surgeon operates, he must explore the abdomen to rule out the presence of ulcer and cholecystitis.

There were twenty-four patients operated on for migraine or a migraine equivalent, seventeen for nervous or functional diarrhea, and fifteen for a sensitive colon or the so-called mucous or spastic colitis. I would like to emphasize the fact that none received any benefit. Fifteen other patients were operated on with the hope of curing the type of regurgitation which, in nervous women, comes immediately after meals, but none obtained relief. I have never seen an operation of any kind cure these people.

There were fourteen patients with gallstones and twelve more with a sore liver and a cholecystitis-like syndrome who had the appendix out, without any relief. Apparently we physicians should discard the old theory that infection in the appendix, draining into the gall-bladder region, will keep up a cholecystitis. There were thirteen patients whose pain in the right lower quadrant of the abdomen appeared to be due to a subacute spondylitis with the related fibrositis, neuritis and myositis. There were ten whose trouble proved, on further study, to have been due to specific food sensitiveness, and ten who were flatulent. Unfortunately, six patients with renal colic had the appendix out a little too hurriedly before the stone in the ureter was discovered. As every one knows, the differential diagnosis in such cases is sometimes difficult. Interestingly,

2. Barber, K. W., and Mayo, C. W.: Appendectomy for the Relief of Chronic Abdominal Pain. *Proc. Staff Meet., Mayo Clin.* 9: 133-134 (1934).

in seven cases the attempt to cure constipation by appendectomy resulted in failure. Actually, in several cases severe constipation appeared to result from the operation. In a large number of the cases the history suggested that the main trouble at the time of operation was that the patient was worn out with overwork and prolonged strain. As every one knows, fatigue can give rise to puzzling digestive syndromes.

Favorable Results and the Odds for Success or Failure.—Most astonishing is the fact that in the 255 cases there were only two in which the operation appeared to work a complete cure. One patient had heartburn. Why he got well I cannot say because another man with heartburn was worse for the operation. The second patient, a youth of 19, suffered with malaise, a toxic feeling, fatigue, anorexia, constipation, and occasional abdominal cramps. He could not remember a definite acute attack but he was cured by appendectomy. These symptoms, when they appear in a previously healthy youth or girl, should always suggest the presence of a smoldering appendicitis, and often they will justify an abdominal exploration and appendectomy.

My data indicate, then, that a patient, and especially an adult, who submits to appendectomy when he has never had an acute attack has perhaps one chance in 100 of getting a permanently satisfactory result. Unfortunately he has about the same chance of dying from the operation. Since there were four patients who had partial relief and four who lost their symptoms for several years, one can say that there are another three chances in 100 of getting some relief.

Against this 4 per cent chance of getting some benefit one must place a 24 per cent chance that the patient will be decidedly worse, a probability that will be discussed in the next paragraph.

The Probability That the Patient Will be Worse.—Unfortunately today most patients and physicians seem to look on an interval appendectomy as something that carries a good chance of working a cure and no chance of doing any harm; in other words, the patient is supposed to have everything to gain and nothing to lose. Would to God that this were true!

Actually, sixty of the 255 patients, or 24 per cent, were decidedly the worse for the operation. Some who could stand their distress and still keep at work before the laparotomy could never work afterward. Twelve said they "hadn't had a well day since," seven were thrown into a bad nervous breakdown, several were unable to sleep well afterward, several developed a worse pain or a pain in a new region, and one became obsessed with the fear of adhesions. In the case of two hypo-ovarian women, menstruation almost ceased after the operation and several others lost all sexual feeling. One was left with a rebellious pyelitis, one with chronic diarrhea and another with an almost intractable constipation. It is sad to think that in four of these cases a lifetime of invalidism followed a rush to the operating room to get relief from a little abdominal discomfort.

Much worth noting also is the fact that thirty-four patients were made so much worse by the first operation that in an effort to improve conditions from one to five more unprofitable laparotomies were soon performed.

In sixteen cases a stoneless gallbladder was removed at the time of the appendectomy because, on seeing that the appendix did not look bad, the surgeon hoped that

an extra operation would add to the chances of the patient's getting well. It didn't.

One frail, constitutionally inadequate girl with pain around the cecum had four successive laparotomies for (1) appendectomy, (2) the breaking up of adhesions, (3) ovariectomy, and (4) exploration, all before she was 20! A psychopathic young woman whose troubles followed worry over an impending divorce had, within three years, an appendectomy and three exploratory laparotomies. In spite of all this the final decree immediately restored her to health. Unfortunately, she lost this health for a while again when she worried over a love affair with another man! A frail girl with hysterical regurgitation submitted within the course of a few years first to gastro-enterostomy and then in succession to appendectomy, cholecystectomy, the taking down of the gastro-enterostomy, and an abdominal exploration. Another regurgitating girl had in succession appendectomy, cholecystectomy, gastro-enterostomy and exploratory laparotomy. Another had this series plus an operation for intestinal obstruction and another, whose appendix was removed with the hope of helping a pyelitis of pregnancy, went on to have a trachelorrhaphy, gastroduodenostomy, cholecystectomy, nephropexy and an exploration for adhesions. In all, sixty-eight secondary operations had been performed on thirty-four patients by the time I saw them, and I am sure that some of the series were not yet complete. A few of these operations, when they were really indicated for the removal of gallstones or an ulcer overlooked at the time of the appendectomy, brought some relief, but the majority, which were done in desperation, did not help.

It will be seen, then, that in this series in which the patient never had an attack of acute appendicitis the chances of losing heavily as compared with the chances of getting cured were thirty to one. The chances of losing heavily as compared with the chances of getting some help were six to one. These certainly are not odds with which to encourage a nervous and worrisome patient.

The Dangers of Rushing Patients to the Operating Room.—The great dangers that a patient runs when he allows himself to be rushed to the operating room with only a little abdominal discomfort were well illustrated during this study. Several times a little examination or history taking or the making of a "scout film" or a urinalysis would have revealed the fact that the patient was suffering with a stone in the gallbladder or ureter, or with pyelitis, multiple sclerosis, tuberculosis of the cecum or an ordinary irritable colon. The real trouble of two patients was that they had suffered a slight stroke.

A college girl was rushed to the operating table so fast that she hadn't a chance to impress the surgeon with the fact that she had just been on the type of "walnut fudge bust" which always gave her a violent allergic stomach ache. Another young woman couldn't convince the surgeon that she always got an alarming stomach ache when she ate onions. One patient had an acute duodenal ulcer which was not helped by the appendectomy; another had a Ménière syndrome with nausea and vomiting due to active but then unrecognized syphilis; another had just had a violent argument with his wife; several school teachers were worn out with fatigue at the end of the school term, and one girl had simply vomited her dinner. In three cases a girl

was thought to have a fever because she had a temperature of 99.5 F. When the appendectomy did no good it was finally decided that the temperature was within the limits of normal.

One of the most interesting of the stories told by the persons who had been rushed to the operating room was that of a young, highly neurotic Jewish woman who always, under any excitement, gets a bad attack of "mucous colitis." Naturally, she had one of the most violent spells of her career a few hours before she was to be married, and as a result she was rushed to the operating room and made to spend her wedding night and her honeymoon alone in a hospital cot. Because the attacks continued after the operation, one must doubt whether she ever had appendicitis.

The Need for Exploring the Abdomen.—In almost all of the 255 cases the scar of the appendectomy was only 2 or 3 inches long, and evidently no abdominal exploration had been done. In one case the operator was inordinately proud because the scar he made was only 1 inch long. He was not so proud later when he learned from a colleague that he had missed a carcinoma of the ascending colon. There were many such cases in which a little exploration would have revealed the really important gallstones or duodenal ulcer and would have saved the patient a second trip to the operating room. The data show clearly that in perhaps ninety-nine out of a hundred cases in which the appendix is removed during an interval and without careful preliminary study the operation, if done at all, should be listed and looked on and proposed to the patient as an exploratory laparotomy. As such it would have some value; as an appendectomy it rarely has any value.

The Fault is Not Always on the Part of the Medical Adviser.—Obviously some mistakes were made, and some of these were made because of the lack of statistical information such as I am now trying to secure. How is a physician to know that appendectomy is useless as a cure for migraine, duodenal ulcer or "mucous colitis" unless he has at hand the recorded experience of many men who have gone before him? Some mistakes were made because of hurry, some doubtless because the physician was tired and worn with overwork, and some because he didn't have good facilities for diagnostic work. Many were made because the physician so desired to help some sweet, frail, ailing girl that he let his heart override his better judgment. I know that in the past some of my own mistakes were made because I yielded to a girl's pleading to go the limit to help her and make her into a normal healthy person again: one able to work and to marry. Perhaps a third of the patients admitted that they had been too willing to be operated on, too anxious to be cured in a hurry, and too unwilling to face months of resting and of grueling efforts at self discipline.

At least four patients insisted on having the operation done after having been warned against it. A stout, red faced saloon keeper was so angry at me for hinting that his troubles were due to overeating and alcoholism that he went home and ordered his surgeon to operate and show up my ignorance. To his credit he it recorded here that when he became no better he returned meekly for a reduction diet. A nervous and strong willed woman, badly upset over the financial losses of 1929, was much annoyed when her physician refused to countenance an appendectomy. She got some one to remove the organ, and when the strain of this operation

drove her deeper into a nervous breakdown she next insisted that her normally functioning gallbladder be removed. Another woman of the same type had a useless appendectomy, nephropexy and finally cholecystectomy, all against the advice of her physicians.

A man with a vague abdominal discomfort and toxic feelings talked me into letting him have an appendectomy. He wanted it because his wife, with a syndrome similar to his, had been relieved by the removal of the appendix. In spite of this favorable psychic preparation for the operation there was improvement for only four months. An interesting case was that of the man who woke one morning with pain around his navel. After his physician had studied him for ten days in the hospital and had decided that there was nothing wrong with him, his nurse took him in hand and talked him into an appendectomy!

The most remarkable story of all was told by a woman who gave as the only reason for her appendectomy the fact that on arriving in Los Angeles one day she found a big convention in full swing and all the hotels full. The only place in which she could find a bed was a hospital, so she took it and had her appendix out. She had always wanted to have it done in a routine manner some time, like a tonsillectomy, so why not then?

The Length of the Period of Relief After an Operation That Did Not Cure.—As every one knows, many a patient with either a functional disturbance or disease in some organ will get well for weeks or months after an operation which was not indicated and which did not remove the cause of the trouble. To learn something more definite about this phenomenon, I kept notes as I went along. Actually I was surprised to find that approximately three out of four patients could not remember having experienced even temporary improvement after the operation. When there was improvement it generally lasted less than three months, but occasionally it lasted for periods up to three years and rarely it lasted for several years. It was remarkable to see that sometimes, after years of relief, the same old soreness and pain in the right lower quadrant could return.

For a while I tried to see why some persons obtained temporary relief and others did not, but I did not learn anything. Some patients thought the relief was due to rest in the hospital and later at home, because the symptoms returned soon after the return to work. The type of anesthetic used was not correlated with the duration of relief. Curiously, some of the persons who had a series of four fruitless operations had no period of relief after any of them, while other patients with such operations had short periods of relief after some, while not after others.

Psychic Effects.—Many physicians have an idea that if a neurotic woman should be operated on and told that her disease had been found and entirely removed she would have to get well, but my data show that this type of psychotherapy was uniformly unsuccessful. Usually the patient was complaining again of her pain before she left the hospital, and when she did feel better for a time she did not stay well.

In one case of this type I advised the appendectomy, first, because the girl's illness had followed two suspicious attacks of abdominal pain, and, second, because there was a bad psychologic situation present which I felt had to be cleared up. With the best of intentions, one physician had told her that she would die if she

did not have the operation and another had told her that her heart would stop on the table if she did. While trying to steer a course between these two inviting contingencies the girl went to pieces nervously and remained a wreck for several years. The operation brought her so much better health that she promptly went back to work, but since some abdominal pain returned in a few weeks I doubt whether she ever had appendicitis.

PART II. CASES IN WHICH THERE WAS A
HISTORY OF ONE OR MORE ATTACKS
OF WHAT LOOKED LIKE ACUTE
APPENDICITIS

There are a number of interesting facts worth emphasizing about the 130 cases in which appendectomy was done for what looked like acute or recurrent appendicitis. Table 2 shows that, taking the group as a whole, 67 per cent were apparently cured, 25 per cent were helped or relieved for a few years, while 5 per cent felt they were no better and 2 per cent were worse.

The 67 per cent of cures in this group of persons who had one or more acute attacks can be compared now with the 0.8 per cent of cures in the group of patients without acute attacks, and the 2 per cent of bad results in the group with acute attacks can be compared with the 24 per cent of bad results in the group without acute attacks. Actually, the percentage of cures in the group with attacks would probably have been larger if it had not been that I was studying patients in a physician's office.

Apparently I was right in doubting the correctness of the diagnosis of acute appendicitis that had been made in many of the twenty-five cases which I listed in the "questionable" column in table 2, because in that group only 48 per cent were cured, 24 per cent were better, 20 per cent were no better, and 8 per cent were worse.

In a number of instances it was impossible to determine whether the operation was really needed or helpful because the patient was well before having the little digestive upset or stomach ache or stitch in the side which led to the performance of a hurried operation, and the patient was just as well afterward.

The Harmlessness of Adhesions.—Very interesting is the fact that adhesions did not seem to bother 73 per cent of the twenty-six patients whose abdomen was drained following rupture of the appendix. Another 19 per cent had some indigestion after the operation, and only one man appeared to be seriously hampered in later life. In his case an abscess broke through into the rectum, and years later the scar seemed to be causing distress. One woman had to have a pelvic abscess drained a year after the appendicitis; another woman who survived peritonitis had one or two mild attacks of intestinal obstruction and then was well. One man had to have a section of bowel resected because of an attack of obstruction, and a woman had to have a hysterectomy, perhaps because of the old peritonitis. Two other patients had some pain or soreness years after the operation. One continued to have trouble perhaps because he was mildly insane. Another suffered with flatulence throughout life but it was impossible to determine what relation this had to the old peritonitis. In one remarkable case a man survived rupture of the appendix with peritonitis to die long after with a carcinoma of the stomach. At necropsy the intestine was

found to be so matted together that no peritoneal cavity could be found—and yet he had been well for twenty years!

Instructive is the fact that only two of the twenty-six patients with an abdomen full of adhesions had to be operated on because of them. Both had one attack of obstruction within a year or two after the appendectomy, and after resection of the constricted segment they were well. In my series of 385 cases, the fifteen operations for nonobstructing "adhesions" were performed on patients in the group who had had a clean "interval operation" which should not have caused many adhesions. Perhaps, as a famous clinician used to say, "adhesions are the refuge of the diagnostically destitute."

Some Instructive Cases in Which the Diagnosis of Chronic Appendicitis Should Have Been Made Earlier Than It Was.—In an occasional case, the conservative clinician will go wrong because he will fail to elicit the history of an attack of acute appendicitis, or he will fail to recognize the true nature of some vomiting spells or stomach aches that the patient describes.

TABLE 2.—Data from 130 Patients Who Had Had Attacks of Definite or Questionable Acute Appendicitis

	Definite Attacks		Ruptured and Drained		Questionable Attacks		Total	Per Cent
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent		
Patients.....	79	..	26	..	25	..	130	..
Cured.....	56	71	19	73	12	48	87	67
Improved.....	14	18	5	19	5	20	24	18
Well for a time.....	7	9	1	4	1	4	9	7
No change.....	2	2	..	..	5	20	7	5
Worse.....	..	..	1	4	2	8	3	2

For instance, a woman came to the clinic in 1935 with a vague story of indigestion coming soon after eating, gas under the heart, nausea, and induced vomiting. Because this story was indefinite, the roentgenologic studies were negative and the woman was neurotic and drinking heavily, a diagnosis was made of functional indigestion. Shortly after this she suffered an acute attack of abdominal pain, and appendectomy then cured her. Later, when I saw her in another illness, careful questioning brought to her mind the fact that some six months before the operation she had been in bed two days with abdominal pain and a rigid lower abdomen.

In another case I failed to realize the significance of some acute digestive upsets suffered by a young man on a vacation trip through the mountains. Fortunately, a surgeon later operated and cured the boy's indigestion and feelings of toxicity, weakness and fatigue.

In still another curious case the complaint was of heartburn, water brash, attacks of diarrhea and sometimes flatulence, several spells of soreness over the cecum, and one attack of momentary excruciating pain in the right lower quadrant promptly relieved by the gurgle of some gas which apparently passed through the ileocecal sphincter. Some of the consultants advised appendectomy, while others felt the indications were too indefinite. The day after the man's return home he had what appeared to be an attack of acute appendicitis, and appendectomy left him so much better that one has to assume that his troubles were due mainly to appendicitis. The puzzling feature is that he returned

recently with some of the old symptoms and the old soreness at McBurney's point.

The most remarkable case in this series was that of an executive of 55 who had always had perfect health and great energy. Then, after a painful accident to his hand he lost his sense of well-being and his "drive" and suffered some indigestion and abdominal discomfort. Two roentgenologic examinations showed prolonged stagnation of the barium sulfate in the last 2 feet of ileum. The man's wife finally remembered that thirty years before he had had a couple of painful attacks of what was diagnosed as acute appendicitis. Shortly after this information was secured the man had an acute attack of appendicitis, and an appendectomy restored his health. The chronically inflamed appendix apparently caused such spasm in the last segment of ileum that the food was held back.

COMMENT

I admit that the group studied is not ideal statistically in that the individuals were found in a physician's office and therefore should belong predominantly in the fraction of unfortunates who failed to be cured. Although there must be some truth in this assumption, I feel sure that it cannot account for the high percentage of poor results reported by the patients who never had acute appendicitis. If such a strong selective force had been at work on the whole group, how could 92 per cent of the patients who had had acute appendicitis be reporting a cure or improvement? Actually, a large percentage of the patients I saw came to the clinic for help with a new problem, one not at all related to the old appendicitis.

But if one objects to this method of obtaining information, what other method can one use? One can use the follow-up method, but for several reasons this is not entirely satisfactory. That something is wrong with it can easily be seen from Shelley's³ frank statement that whereas 89 per cent of a large series of patients who had microscopic signs of disease in the appendix got well after removal of the organ, 80 per cent of those whose appendix showed no signs of disease also reported themselves as cured.

SUMMARY

On studying the histories of 385 patients who, some years before, in their home cities, had submitted to appendectomy, I found that only two, or 0.8 per cent, of the 255 who had never had an acute attack of appendicitis were cured, while eighty-seven, or 67 per cent of the 130 who had had at least one acute attack of abdominal pain, were cured. If one takes into account also those cases in which some help was obtained, the respective percentages of good plus fair results in the two groups become 4 and 92.

In the group of patients who did not have an acute attack, the commonest reason for operating was the type of abdominal discomfort which goes often with constitutional inadequacy, chronic fatigue, a nervous breakdown or a psychopathic makeup. Other common reasons for operating were that the patient had a duodenal ulcer or ulcer-like symptoms, migraine, functional diarrhea, a sensitive colon, nervous regurgitation, gallbladder disease, a sore liver, spondylitis, food sensitiveness, renal colic or constipation. Only one of the patients with these troubles was helped permanently by the operation.

Twenty-four per cent of the patients were decidedly the worse for the operation. In thirty-four cases, failure of the appendectomy to help led to the performance of sixty-eight more laparotomies, most of which did not bring good results.

All of the patients who were rushed to the operating room in the absence of typical symptoms of acute appendicitis failed to get good results. Apparently it is not possible to diagnose chronic appendicitis roentgenologically, because in every one of the twenty cases in which this was attempted the operation brought no relief.

Seventy-three per cent of the patients who had peritonitis after rupture of the appendix had no further trouble, in spite of the probable presence of dense adhesions. In the total series of 385 cases the fifteen operations (all fruitless) for nonobstructing adhesions were all performed on patients who had had a clean interval appendectomy. Only two operations for adhesions were performed on the twenty-six persons who had had generalized peritonitis and each was made necessary by an attack of intestinal obstruction.

Only one in four of the patients who were not cured by appendectomy experienced temporary improvement, and then the period of relief was usually less than three months. The theory that one can cure the abdominal distresses of a neurotic or psychopathic patient by first assuring her that all the symptoms arise in one organ and then removing that organ is not borne out by the experience of the patients interviewed. The results of the procedure were uniformly bad.

There appear from this investigation to be only two definite indications for an interval appendectomy. One is that the patient has had one or more attacks of what looked like acute appendicitis, followed by indigestion, loss of energy, toxic feelings, a sore cecum and perhaps abdominal cramps; another indication is the appearance of these symptoms in a youth or a girl who has previously been well. Then the appendectomy sometimes works a cure. Occasionally an ulcer-like syndrome is due to chronic appendicitis.

It was noted that a large percentage of the patients who were cured by appendectomy had the operation before they were 25, while a large percentage of those who had poor results from the operation had it when they were over 25.

It would seem that true chronic appendicitis, instead of being regarded as the commonest intra-abdominal disease, should be thought of as one of the rarest.

Osler's Three Ideals.—I have three personal ideals. One, to do the day's work well and not to bother about the morrow. It has been urged that this is not a satisfactory ideal. It is; and there is not one which the student can carry into practice with greater effect. To it, more than anything else, I owe whatever success I have had, to this power of sitting down to the day's work and trying to do it well to the best of (real) ability and letting the future take care of itself. The second ideal has been to act the Golden Rule, as far as in me lay, toward my professional brethren and toward the patients committed to my care. And the third has been to cultivate such measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and to be ready when the day of sorrow and grief came to meet it with courage befitting a man. I have made mistakes but they have been mistakes of the head, not of the heart.—Quotation by S. A. MacDonald from Osler's farewell address to America, published in *University of Western Ontario Medical Journal* 10:1 (Nov.) 1939.

3. Shelley, H. J.: Chronic Appendicitis: Is It a Clinical Entity? *Arch. Surg.* 37:17-45 (July) 1938.

APPENDICITIS

AN ANALYSIS OF 1,153 CASES AT THE CINCINNATI
GENERAL HOSPITAL

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For the present knowledge of appendicitis and the important concepts of its surgical treatment physicians are indebted to Fitz, Murphy, McBurney and others, who, during the last fourteen years of the nineteenth century, succeeded in acquainting the medical profession with the clinical picture of the disease. If one remembers that, only a short while before, inflammation of the right lower quadrant had been a little understood and frequently fatal disease, the brilliant results obtained by these men must seem remarkable. How little has been added to their concepts becomes apparent on reviewing their articles and painfully so when the results of modern therapy are compared with those obtained by these pioneers fifty years ago.

It was not until 1925 that, through the reports of the United States Bureau of Census and of some of the larger life insurance companies, physicians became aware that the mortality from appendicitis was rising. Bower¹ found that the death rate per hundred thousand of population was 22.3 per cent higher in 1923 than it had been ten years before, and he came to the conclusion that the prehospital management of the patient was in a large part responsible for the excessive mortality. This opinion was supported and confirmed by the investigations of many others. Nearly every one has recognized that the excessively long period of time between the onset of the disease and the operation and the unfortunate habit of taking cathartics for abdominal pain have been important factors in increasing the mortality from appendicitis. Reid² has felt that, in addition to these factors, mistakes of surgical judgment and operative procedure have often been responsible for poor results, an opinion sustained by the improvement in mortality at the Cincinnati General Hospital after the McBurney incision became routine practice. It is our belief that such an unfortunate situation has occurred, at least partly, because of the failure of the medical profession to recognize its responsibility in the matter of educating the public in regard to the dangers of and the management of abdominal pain, and also from the attitude of some physicians who still insist on delaying operation after a diagnosis of acute appendicitis is made, in the hope that the process will subside. It was surprising to find that twelve patients in our series reported that cathartics had been prescribed by the attending physician.

In some places, notably Philadelphia, efforts were made to improve the situation, and it is not unwise now to review the Philadelphia campaign and its results, even though they have long since become generally known. Stickers describing the course to be followed in the event of abdominal pain and placards advising the avoidance of cathartics in such a situation were publicly displayed in drug stores and elsewhere. A great deal of additional propaganda was used to acquaint

the public as well as possible with proper procedure when appendicitis was suspected. The effectiveness of such a campaign is indicated by the fact that in Philadelphia the mortality decreased 19.43 per cent in 1930 as compared with 1928 and 1929.³ During the same period the incidence of perforation decreased 17.04 per cent and the delay period between the onset and the operation was decreased 11.81 hours.

In spite of the apparent general increase in appendicitis mortality, some reason for optimism is to be found in the fact that while the deaths per unit of population are increasing, the mortality among patients treated surgically seems to be decreasing. This is well demonstrated by Schullinger's⁴ cases from the Presbyterian Hospital in New York. Walker⁵ also found this decrease in mortality based on operations and noted that deaths due to peritonitis without specific cause have shown the same trend. It may possibly be true that the apparent increase in the deaths from appendicitis is in part attributable to better medical diagnosis or to more careful statistical work.

We have been greatly concerned about the large number of deaths from appendicitis occurring in Cincinnati. At the time of the publication of a paper by Reid, Poer and Merrell⁶ the appendicitis death rate in this city was the highest of any large city in the United States. Since then an intensive educational campaign has been carried on, both in the medical profession and among the people, under the joint direction of the Academy of Medicine of Cincinnati and the Public Health Federation. This undertaking has resulted in the lowering of the resident death rate from a yearly average of 17.3 per hundred thousand of population during the three year period 1929-1931⁷ to 11.3 in 1937, and it will be interesting to compare the statistics of the present series with those of the previous nineteen years, which were reviewed in the paper by Reid and his associates.

ANALYSIS OF CASES

The variety and number of terms used in the classification of appendicitis, especially when the inflammation has extended beyond the appendix itself, has been quite confusing and, we believe, somewhat inaccurate. The use of such nomenclature as spreading peritonitis, diffusing peritonitis, generalized peritonitis and local peritonitis seems unjustified, if we consider that it is difficult to be certain of the extent of the peritonitis except by exploration at operation, a procedure which is not justified in such a situation. Therefore, in consideration of those cases in which the process has extended outside the appendix, we shall employ the terms abscess and peritonitis. A few cases of early rupture in which peritonitis had not developed are included under the term acute unruptured.

Classification.—We have carefully reviewed the case records of 1,153 patients treated at the Cincinnati General Hospital during the years 1934 to 1938 inclusive (table 1). Of these patients 921 had acute and 232 chronic or interval appendicitis. Of the 338 with acute involvement in which the process had extended beyond the confines of the appendix, 209 had peritonitis and 129

From the Department of Surgery of the University of Cincinnati College of Medicine, and the Cincinnati General Hospital.

1. Bower, J. O.: *Acute Appendicitis*, J. A. M. A. 96: 1461 (May 2) 1931.

2. Reid, M. R.: *Some Remarks on the Operative Procedures for Appendicitis*, Surg., Gynec. & Obst. 59: 529 (Sept.) 1934.

3. Bower, J. O.: *The Mortality of Acute Appendicitis*, J. A. M. A. 99: 1765 (Nov. 19) 1932.

4. Schullinger, R. N.: *Acute Appendicitis and Associated Lesions*, Arch. Surg. 32: 65 (Jan.) 1936.

5. Walker, I. J.: *Why the Increasing Mortality in Appendicitis*, Am. J. Surg. 25: 228 (Aug.) 1934.

6. Reid, M. R.; Poer, D. H., and Merrell, Paul: *A Statistical Study of 2,921 Cases of Appendicitis*, J. A. M. A. 106: 665 (Feb. 29) 1936.

7. During this period the crude death rate from appendicitis, which included nonresidents, was over 30 per hundred thousand of population.

had local abscess formation. This division differs considerably from that of the preceding nineteen years, when of 865 patients with perforated appendicitis only 289 had peritonitis while 576 had formed abscesses. In other respects the two periods compared very closely in regard to classification. Although there has been some decrease in the number of acute cases with perforation,

TABLE 1.—Classification

Pathologic Condition	1934-1938 Inclusive		1915-1933 Inclusive	
	Number	Per Cent	Number	Per Cent
Acute unruptured.....	583	50.56	1,170	41.1
Acute with perforation	338	29.31	865	30.4
		(36.7% of all acute cases)		(42.51% of all acute cases)
Peritonitis.....	209		289	
Abscess.....	129		576	
Chronic and interval..	232	20.12	810	23.5
Total.....	1,153		2,845	

TABLE 2.—Average Elapsed Time Between Onset of Acute Attack and Admission to Hospital

Pathologic Condition	1934-1938 Inclusive (Elapsed Time in Hours)	1915-1933 Inclusive (Elapsed Time in Hours)
Acute unruptured.....	33.1	44.0
Acute with perforation.....	100.0	
Peritonitis.....	64.9	80.64
Abscess.....	145.9	129.6

the slight improvement represented by the figure 36.7 per cent in the period 1934-1938 as compared with 42.51 per cent for the preceding nineteen years is at first glance hardly encouraging. However, it should be emphasized that all cases reported in this series and the former one involved charity patients who, in general health and education, were far below the average of private patients. Their response to a general educational program could scarcely be expected to be as good as that of private patients.

Age.—The mean age of all the patients included in this series was 25.1 years. Of those with unruptured acute appendicitis the mean age was 20.3 years as compared with 30.8 years for those in whom perforation had taken place.

The total of 423 cases in the second decade of life was the greatest number occurring in any age group. The greatest number of ruptured cases (ninety-six) also occurred in this period. The third decade had the second highest incidence (320), and the number of cases gradually diminished in the older age group.

Sex.—In this series there were approximately twice as many males as there were females. Of the total number of patients 771 (66.9 per cent) were males and 382 (33.1 per cent) were females, and of the patients with perforation 255 (75.4 per cent) were males and eighty-three (24.55 per cent) were females.

Race.—Race distribution in general followed that found in the general hospital census. Of the total patients 896 (77.71 per cent) were white and 257 (22.3 per cent) Negro, while among patients with perforation the distribution was 229 (67.75 per cent) white and 109 (32.25 per cent) Negro.

Seasonal Distribution.—The cases studied had a moderately even distribution among the months, although there was a slight rise in the number of admissions during the early summer. The 114 patients admitted

in June were the most numerous in any month, while the eighty-five admitted in November were the least.

Delay in Hospitalization.—We were interested in comparing the time from the onset of the disease until admission to the hospital during this period with that of the preceding nineteen years and were gratified to find that there had been a rather marked improvement (table 2). This dangerous period of delay had decreased from forty-four hours to 33.1 hours for the group having unruptured acute appendicitis. In the group with appendical abscess formation it was 145.9 hours as compared with 129.6 hours for the previous period, an increase that is not disturbing in this particular type of case. For those with peritonitis the delay was 64.9 hours as compared with 80.64 hours formerly. The time from onset to admission for all patients with ruptured appendix, including both those with peritonitis and those with abscess formation, was 100 hours. The yearly variation of the delay period was not significant, as it gradually decreased in the acute unruptured type of involvement from 1934 through 1937 and then rose sharply to 45.6 hours in 1938.

Cathartics.—It seems beyond understanding that the public has not as yet become well enough informed about the dangers of acute appendicitis to avoid the use of cathartics when abdominal pain is present. Of the 921 patients with the acute type 410, or 44.5 per cent, gave a history of having taken some cathartic (table 3). Our series clearly illustrates the long known fact that in appendicitis there is a definite correlation between perforation and cathartics, for only 214, or 36.7 per cent, of those with acute unruptured appendicitis gave a history of having taken cathartics, while 196, or 58.0 per cent, of those in whom rupture had occurred reported this. One of the most regrettable facts found in our study of catharsis in appendicitis was that

TABLE 3.—Catharsis in Acute Cases

Pathologic Condition	Number of Patients	Per Cent
Acute unruptured.....	214	37.7
Acute with perforation	196	58.0
Total.....	410	44.5
	(12 on doctor's prescription)	

TABLE 4.—Mortality and Complications in Peritonitis, Drained and Undrained

Number of cases.....	Drained 130		Not Drained 55	
	Number	Per Cent	Number	Per Cent
Mortality.....	21	16.2	5	9.1
Pelvic abscess.....	12	9.2	7	12.7
Abdominal abscesses.....	2	1.5	1	1.8
Subphrenic abscesses.....	3	2.3	1	1.8
Liver abscesses.....	2	1.5	0	0.0

twelve patients reported that they had taken such medication on the advice of their doctor. Magnesium sulfate and castor oil proved to be the most popular purgatives, some patients having taken both.

Clinical Data.—The occurrence of clinical signs and symptoms in our series did not greatly differ from that reported in other series. Abdominal pain occurred in 99.5 per cent of our patients, nausea in 83.9 per cent, vomiting in 70.8 per cent and rectal tenderness in 62.1 per cent, while 56 per cent gave a typical history. Perhaps our figure for rectal tenderness is higher than

should be expected. This sign, of course, depends on the interpretation of the examiner and is subject to personal errors.

Laboratory Data.—The mean temperature for all patients with acute appendicitis was 100.2 F., while the mean white count was 15,196. For those with the unruptured acute type the mean temperature was 100.0 F. and the mean white blood count 14,949. This was not greatly different from the mean temperature of 100.6 F. and the mean white count of 15,609 found for patients having a perforation of the appendix.

Anesthesia.—Of the 1,153 patients in the report 1,130 were operated on. In general it has been our policy to use nitrous oxide-ether anesthesia when operating on patients with appendicitis, as a rule reserving spinal anesthesia or local infiltration of the procaine hydrochloride for cases in which general anesthesia is contraindicated. For the 1,130 patients operated on spinal anesthesia was used 135 times, or in 11.9 per cent of the operations, while local was used twenty-two times, or in 1.9 per cent. In all other cases general anesthesia was given. Occasionally during the past three years we have used cyclopropane.

Incision.—There is no doubt that the policy of operating through a McBurney incision whenever appendicitis is diagnosed or suspected has done much to reduce the mortality from this disease at the Cincinnati General Hospital. In this series, 1,097 patients were operated on through McBurney incisions and twenty-two through right rectus incisions. When a right rectus incision was made, the choice of incision was generally due to an error in diagnosis. Of the remaining patients two were operated on through inguinal incisions, two through the flank and two through a midline incision. In both cases in which an inguinal incision was made, an acutely inflamed appendix was found in a hernia sac. Five appendical abscesses were drained through the rectum.

Operators.—The number of surgeons operating on the patients reported in this series was relatively large, nineteen having operated on ten or more.

Position of the Appendix.—In 131 (11.6 per cent) of the cases in which operation was performed, the appendix was partially or completely retroperitoneal, while in sixty-five (5.8 per cent) it was partially or completely pelvic.

Conservative Treatment.—It is impossible to read recent articles on the subject of appendicitis without being impressed with the great enthusiasm which has been aroused by the results of the conservative treatment in certain cases of acute appendicitis with perforation. In spite of this, however, we have not generally adopted this idea, and our small series of conservatively treated patients can in no sense be regarded as a true indication of the value of conservative therapy. Excepting patients with appendical abscess formation, we have used conservative therapy only with those considered too sick for operation, such a course often being determined on after finding abdominal distention in severe cases of peritonitis. Whether or not this policy is wise can be determined only by comparing our results with those of clinics where conservative treatment is resorted to more frequently. In this series there were twenty-three patients who were not operated on, but for only sixteen of these was conservative therapy adopted by choice. Five of the remaining seven refused operation, while failure to operate on two was due to a mistake in diagnosis. There were two addi-

tional patients treated conservatively at the beginning who eventually had to be operated on. This raised the total of conservatively treated patients to eighteen, and of this number nine had appendical abscess formation and the other nine peritonitis. Seven of these eighteen patients died, the mortality in this group therefore being 38.8 per cent.

Drainage.—In our efforts to reduce the number of deaths from ruptured appendicitis with peritonitis, we have adopted among other measures the practice of closing the peritoneum without drainage of the abdominal cavity in certain selected cases, and in general our results from this procedure have given considerable satisfaction. The indications which we think constitute a sound reason for failure to drain the abdomen when peritonitis is present will be discussed later. Of fifty-five patients with peritonitis whose

TABLE 5.—Postoperative Complications

Complications	Acute Unruptured (583 Cases)	Peritonitis (209 Cases)	Abscess (129 Cases)	Chronic and Interval (232 Cases)	Total (1,153 Cases)
Wound infection (clean cases).....	31	0	0	4	35
Gas bacillus infection of wound.....	0	0	1	0	1
Hematoma of wound.....	4	0	0	1	5
Secondary intraperitoneal abscess.....	7	27	9	0	43
Subphrenic abscess.....	0	8	1	0	9
Liver abscess.....	0	2	1	0	3
Fecal fistula.....	2	2	4	0	8
	2	0	5	1	8
	0	1	0	0	1
	0	0	1	0	1
Pneumonia.....	10	11	13	1	35
Bronchitis.....	3	2	0	2	7
Pleuritis.....	2	1	1	0	4
Empyema.....	0	2	2	0	4
Atelectasis.....	5	5	2	2	14
Pulmonary infarct.....	0	0	1	0	1
Pulmonary embolism.....	0	1	0	0	1
	0	1	0	0	1
	3	1	2	0	6
Pylephlebitis.....	0	0	1	0	1
Hemiplegia.....	0	1	0	0	1
Pulmonary hemorrhage.....	1	0	0	0	1
Intra-abdominal hemorrhage.....	0	0	1	0	1
	0	1	3	0	4
	1	0	1	0	2
	0	0	1	0	1
Uremia.....	1	1	1	0	3
Parotitis.....	0	2	1	0	3
Abscess of the thigh.....	1	1	0	0	2
Abortion.....	2	0	1	0	3

abdominal cavity was closed without drainage, five died, a mortality of 9.1 per cent, while of 130 such patients in whom drains were inserted twenty-one died, a mortality of 16.2 per cent (table 4). But in the matter of complicating pelvic abscesses, the results were not so encouraging, as seven, or 12.73 per cent, of those without drainage, as compared with twelve, or 9.2 per cent, of those with drainage had this complication. We may summarize the results of nondrainage of the peritoneal cavity in peritonitis by saying that, although our series is too small to permit dogmatic statements, it has been attended by a reduced mortality but increased incidence of pelvic abscesses.

Complications.—The list of complications encountered in this series is too long for detailed discussion and is readily available in table 5. We were surprised to find that of 583 patients with acute unruptured appendicitis thirty-one had wound infections, while of 232 with chronic or interval appendicitis four contracted infections in their wounds.

Period of Hospitalization.—Patients with acute unruptured appendicitis were in the hospital for a mean length of time of 9.6 days. The length of time

spent in the hospital by patients with peritonitis and by those with abscess formation was not greatly different, as the mean time was 20.2 days for the former group and 22.2 days for the latter. Although we did not compute the length of this period for those with chronic or interval appendicitis, such patients are usually discharged from the hospital on the sixth or seventh day after operation. The mean length of the period of hospitalization for the entire series was 12.9 days.

Mortality.—There were fifty-six fatal cases in our series, a mortality rate of 4.86 per cent (table 6). Death and mortality were divided among the various groups as follows: Of the patients with acute unruptured appendicitis six died (mortality 1.03 per cent), in the peritonitis group there were thirty-six deaths (mortality 17.22 per cent), in the appendical abscess group thirteen deaths (mortality 10.08 per cent), and among those with chronic or interval appendicitis there was one fatality (mortality 0.43 per cent). It is impossible to do more than approximately compare the mortality in this series with that of the series covering the previous nineteen year period, except on the basis of total mortality. The reason for this is that in the former series the mortality according to case groups was computed only on the basis of operations. However, all except 115 of the 2,921 patients were operated on. At the present time we do not feel justified in repeating this especially in view of the tendency not to operate on patients with perforated appendicitis. As some of those not operated on during the previous period were moribund and eventually died, any comparison of the mortality in the various types of cases will tend to magnify the improvement which occurred during the past five years. In total mortality the decline of the death rate from 6.4 per cent in the period 1915 to 1933 inclusive to 4.86 per cent in the present series represents a substantial improvement. The death rate in peritonitis decreased from 33.9 to 17.22 per cent, but in the appendical abscess group there was only a slight improvement. In commenting on the increase from 0.86 to 1.03 per cent in the mortality of acute unruptured appendicitis, it is fair to point out that in most cases death was due to causes outside the abdomen.

TABLE 6.—Mortality

Pathologic Condition	Number of Cases	Number of Deaths	Mortality, %	Mortality % 1915-1933 (Operative)
Acute unruptured.....	583	6	1.03	0.86
Peritonitis.....	209	36	17.22	33.9
Abscess.....	129	13	10.08	11.4
Chronic and interval.....	232	1	0.43	0.13
Totals.....	1,153	56	4.86	6.4
				(operative and nonoperative cases)

The lowest yearly mortality was 3.1 per cent in 1936, while the highest was 6.2 per cent in 1938.

We have computed the mortality and pathologic changes in acute appendicitis relative to the duration of the disease at the time of admission to the hospital, and our data have been in accord with the well known fact that delay increases both deaths and perforations. The highest mortality (14.7 per cent) was among patients admitted more than six and one-half days after the beginning of symptoms and the next highest (10.9 per cent) in the group admitted from seventy-two to ninety-six hours after the onset. The lowest

mortality (3.8 per cent) was in the group coming to the hospital during the first forty-eight hours. The incidence of acute cases with perforation increased gradually from 21.8 per cent during the first forty-eight hours to 78.7 per cent after six and one-half days.

Causes of Death.—This series substantiates the well known fact that diffuse peritonitis associated with

TABLE 7.—Causes of Death

Pathologic Condition	Deaths	Cause of Death
Interval	1	Generalized peritonitis
Acute unruptured	1	Generalized peritonitis
	1	Generalized peritonitis and lobular pneumonia
	1	Lobar pneumonia and lobular pneumonia
	1	Uremia
	1	Pulmonary hemorrhage
	1	Pulmonary embolism
	6	
Abscess	3	Lobular pneumonia
	2	Lobar pneumonia
	1	Generalized peritonitis
	1	Pylephlebitis
	1	Heart failure
	1	Retroperitoneal abscess and toxemia
	1	Septicemia and lobular pneumonia
	1	Liver abscess and lobular pneumonia
	1	Generalized peritonitis and septicemia
	1	Cause of death unknown
	13	
Peritonitis	20	Generalized peritonitis
	3	Lobular pneumonia
	2	Generalized peritonitis and lobular pneumonia
	2	Liver abscess
	1	Generalized peritonitis and pericarditis
	1	Generalized peritonitis and liver abscess
	1	Subphrenic abscess and possible rupture into chest
	1	Pulmonary embolism
	1	Hemorrhage from wound
	1	Transfusion reaction
	1	Died on the operating table
	1	Questionable; possible toxemia from r. i. q. abscess
	1	Lobar pneumonia
	36	

paralytic ileus is the principal cause of death in acute appendicitis. Of the fifty-six fatalities, twenty-seven occurred as a result of diffuse peritonitis. The cause of death in the remaining cases form a long and varied list that is well illustrated in table 7. However, in commenting on the six deaths occurring in the group with acute unruptured appendicitis we would point out that four of the patients had pulmonary complication including pneumonia, pulmonary hemorrhage and pulmonary embolism, while a fifth died of uremia.

COMMENT

In general there has been an improvement in the statistics for the past five years as compared with the previous nineteen, and we believe that our total results compare favorably with those of other similar hospital and charity institutions. Sperling and Myrick⁸ reported a total mortality of 5.6 per cent (1932 to 1935). Kelly and Watkins⁹ 5.4 per cent (1931 to 1936) and Lehman and Parker¹⁰ 3.27 per cent (1933 to 1937). There can be no doubt, however, that the lack of any marked improvement in the mortality from appendical abscess is a rather poor commentary on the treatment of the

8. Sperling, Louis, and Myrick, J. C.: *Acute Appendicitis*, *Surg.* 1: 255 (Feb.) 1937.
9. Kelly, F. R., and Watkins, R. M.: *Appendicitis in Adults*, *J. M. A.* 112: 1785 (May 6) 1939.
10. Lehman, E. P., and Parker, W. H.: *The Treatment of Peritoneal Abscess Arising from Appendicitis*, *Tr. Am. S. A.* 36: 1938.

cases. Ransom,¹¹ in a review of the recent literature, has cited the following mortality rates in this particular group of patients: Finney 4.56 per cent, Haggard 5 per cent, Keyes 7.3 per cent and McClure and Altemeier 4.2 per cent. It is readily seen that in all these series the mortality rate of appendical abscess is much lower than the 10.08 per cent in our series. However, the general condition of the private patient and his preoperative and postoperative care undoubtedly account for a great deal of the difference in the figures cited.

During the past few years there has been a definite trend toward greater conservatism in the treatment of appendical abscesses, both in this country and abroad, and the effect has been a lowering of mortality and the stimulation of great enthusiasm on the part of the advocates of this form of treatment. In the series of Lehman and Parker the mortality in the group treated conservatively was only 1.5 per cent, while of the patients operated on by choice 6.2 per cent died. During 1936 and 1937 these authors started conservative therapy on 83.3 per cent of the patients with abscess formation and 65 per cent never had to be operated on.

We believe that it is often good judgment in cases of walled off abscess to observe the trend of the process before deciding what to do, and our tendency has been toward more conservatism in the treatment of patients with this complication. In general, our policy has been to wait for the most favorable time before operating on these patients. However, almost all of those with appendical abscesses in this series were eventually operated on before being discharged from the hospital, a fact which indicates that we have not yet become as conservative as most others who advocate this course. (It is not advisable to remove the appendix when operating on a patient with an abscess unless this can be accomplished without disturbing the walling off process, and when pus is encountered it is wise simply to drain and leave the appendix until it can be removed at a later date.) When the appendix has not been removed the patient is always advised to return six months later for an appendectomy. In commenting on our treatment of appendical abscess and the results we have obtained, it is believed that greater conservatism may have yielded better results.

As contrasted with the mortality of the abscess group, our series mortality of 17.22 per cent in cases of peritonitis has been gratifying, particularly in view of the fact that during the preceding nineteen years the operative mortality alone was 33.9 per cent in this group. Although because of differences in classification it is difficult to make accurate comparisons, the peritonitis mortality in this series compares very favorably with that of other hospitals.

In treating this type of case we believe that it is wise to remove the appendix through a small McBurney incision and to drain or not, depending on the amount of contact necrosis and actual fecal contamination of the peritoneal cavity. While one cannot say dogmatically that the improvement was due solely to the McBurney incision, the mortality in appendicitis at the Cincinnati General Hospital dropped from 9.5 to 5.4 per cent after this type of incision became routine practice. Few patients with peritonitis are treated conservatively, this course usually being reserved for those who are moribund or very poor operative risks.

Yates¹² and others have shown that adequate drainage of the peritoneal cavity is physically and physiologically impossible and, in addition, not entirely without danger. However, it is still difficult for many to decide whether the abdomen should be drained or closed in peritonitis of appendical origin. While we do not agree with Buchbinder's¹³ statement that patients with diffuse peritonitis should never have drainage, we do believe that unless extensive necrosis or actual fecal contamination of the peritoneal cavity is present it is better to close the peritoneum and drain the wound down to it. The wisdom of such a course is attested by the low mortality in cases in which we have closed the abdomen without drainage.

At the Cincinnati General Hospital all patients with peritonitis having its origin in the appendix are treated with continuous gastric expression, Fowler's position, intravenous dextrose solution and saline hypodermoclysis until peristalsis returns and the patient is able to take an adequate amount of fluids by mouth. Another therapeutic measure that may have done much to lower the mortality in this group is the practice of giving repeated small blood transfusions.

Since the development of the Miller-Abbott tube for use in the treatment of intestinal obstruction, we have attempted on a few occasions to employ it in the treatment of paralytic ileus associated with peritonitis. However, we have experienced great difficulty in getting the tube into the small intestine, a failure probably attributable to the absence of peristalsis in such cases.

SUMMARY

1. In a series of 1,153 cases of appendicitis treated at the Cincinnati General Hospital, 921 were acute and 232 were chronic or interval. Of the acute cases the appendix was ruptured in 338, or 36.7 per cent, a slight improvement being shown over the preceding nineteen years.

2. The average elapsed time between the onset of symptoms and admission to the hospital was 33.1 hours in acute unruptured appendicitis as compared with forty-four hours during the previous nineteen years. In cases in which the appendix had ruptured, the length of this period was 100 hours.

3. Of the patients with acute appendicitis 410 (44.5 per cent) gave a history of having taken a cathartic. On further analysis it was found that 58.0 per cent of the patients with perforation and 36.7 per cent of those without perforation were guilty of this.

4. The total mortality rate of 4.86 per cent was divided as follows: 1.03 per cent in acute unruptured appendicitis, 17.22 per cent in peritonitis, 10.08 per cent in appendical abscess and 0.43 per cent in chronic and interval appendicitis.

5. In this series we have found a gratifying decrease in the total mortality and in the mortality in peritonitis as compared with that of the previous nineteen years, but the very slight improvement in the abscess group is discouraging.

6. Greater conservatism in treating patients with appendical abscess might have resulted in a decrease in the mortality of this group.

7. In treating peritonitis of appendical origin we consider it wise to remove the appendix through a small McBurney incision and to drain or not, depending on the amount of necrosis and fecal contamination.

11. Ransom, H. K.: Delayed Intervention in Appendical Abscess and Spreading Peritonitis Due to Appendicitis. *Internat. Abstr. Surg.* 68: 339, 1939, in *Surg., Gynec. & Obst.*, April 1939.

12. Yates, J. L.: An Experimental Study of the Local Effects of Peritoneal Drainage. *Surg., Gynec. & Obst.* 1: 473, 1905.

13. Buchbinder, J. R.: Surgical Limitation in the Treatment of Acute Suppurative Appendicitis. *Surg., Gynec. & Obst.* 59: 485 (Sept.) 1934.

CIRCULATORY FAILURE OF CAPILLARY ORIGIN

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Circulatory disturbances may arise from defective action of the pumping mechanism itself, from the agencies which influence the heart's action and from abnormal vasomotor reactions. It is obvious that loss of blood or fluid, directly or indirectly, may disturb the circulation. These causes for circulatory deficiency are discussed adequately in medical literature. But circulatory disturbance originating in the visceral capillary stream bed has not received the attention it merits.

CAPILLARY DISORDER

Increased knowledge concerning the capillaries and their reactions has made possible an analysis of several enigmatic circulatory phenomena. It has been shown (Ebbecke,¹ Krogh,² Lewis³) that capillaries possess tonus and contractility independent of the adjacent arteries and veins. Capillary endothelium is delicately sensitive to physiologic conditions such as oxygen tension and products of metabolic activity. Likewise it is exceedingly susceptible to the action of a wide variety of noxae, including chemicals, poisonous drugs, anesthetics, venoms, bacterial toxins, products of protein cleavage and the like. Under the influence of any noxious agent the endothelium loses its normal tonus and becomes abnormally permeable to blood plasma. Any agent or condition injurious to capillary endothelium increases its permeability. Landis⁴ obstructed an artery by pressure for three minutes. The lack of oxygen thus produced caused a fourfold increase in the permeability of the capillaries in the field supplied by the artery. Various chemical agents injected into the blood caused a sevenfold increase in endothelial permeability.

The pathologic effects of injury to capillary endothelium may be shown diagrammatically as in figure 1.

When the endothelium is injured by any agent or condition, it allows plasma to escape into the tissue spaces, thus producing edema and oftentimes serous effusions. The corpuscles become closely packed in the dilated capillaries and venules, and circulatory stasis results. Stasis of the circulation is the surest sign of increased endothelial permeability (Landis). Correspondingly there occurs an increase in the number of corpuscles per unit volume of blood. If the area of capillary atony is local, the hemoconcentration may be limited to that field. If capillary atony has occurred in extensive visceral areas, the corpuscular content of the systemic circulation is increased in a degree proportional to the total loss of plasma from the blood.

Widespread loss of capillary tonus causes a circulatory deficiency clinically resembling that produced by massive hemorrhage. The two conditions may be differentiated by the hemoconcentration which accompanies the one and the hemodilution which follows any considerable loss of blood by hemorrhage (Moon⁵).

As a result of capillary atony there is a decrease in both the actual and the effective blood volume. The

leakage of plasma into the tissue spaces and capillaries reduces the actual blood volume and produces hemoconcentration. The sequestration of blood by stasis in dilated capillaries and venules reduces the effective blood volume. This reduction tends to lower the efficiency of the circulation. Physiologically this is compensated by arterial vasoconstriction and by the discharge of blood from reservoir organs such as the spleen. So long as the compensation is effective there is no serious decline in the blood pressure but the latter is maintained at the expense of the volume flow of blood. Maximal arterial constriction may reduce the volume flow far below an adequate physiologic level and seriously reduce the delivery of oxygen to the tissues. Capillary endothelium is delicately sensitive to lack of oxygen (Krogh, Landis). When tissue anoxia develops, the capillaries become atonic and abnormally permeable. This fact supplies the connecting link in the vicious circle of shock. Capillary atony and tissue anoxia are the major factors in the mechanism of this type of circulatory deficiency. Either of these factors, induced primarily by whatever means, presently causes the development of the other. This constitutes a reciprocal relationship which gives the circulatory deficiency a self-perpetuating quality. This relationship is illustrated in figure 2.

Capillary factors are fundamental to this type of circulatory failure. Essentially it results from an uncompensated disparity between the volume of blood and the volume capacity of the vascular system. That disparity arises from a decreased blood volume, as already described, plus an increased volume capacity caused by dilatation of capillaries and venules in extensive areas. When compensation is no longer effective, the blood pressure declines progressively and the complete syndrome of shock is manifested clinically. That syndrome presents a highly characteristic group of clinical features:

Prostration is evident; the patient is profoundly depressed, weak and restless. The pulse is rapid, feeble and of small volume. The extremities are cold and the body temperature is low. The face is drawn, ashen or livid in color, anxious in expression and moist with cold sweat. The eyes are sunken and surrounded by bluish rings, producing the classic hippocratic facies. Thirst is incessant, but attempts to relieve it are ineffective because of vomiting. The fluid vomited is often in excess of that swallowed, and it contains small brown flocculi. Perspiration is profuse, and there may be diarrhea. The respirations are shallow and interspersed with deep sighs. The blood pressure declines progressively. Urination is scanty or suppressed. Consciousness is retained until finally there is loss of sensitivity, of responsiveness to stimuli and of reflexes. Unconsciousness or coma precedes death. It should be noted that sometimes a marked and rapid increase in temperature—agonal fever—precedes death.

The clinical syndrome just described is accompanied by an equally characteristic group of departures from physiologic constants. These are a reduced total and effective blood volume; a reduced minute volume cardiac output and volume flow of arterial blood; hemoconcentration as shown by counts of red cells, hematocrit, specific gravity and hemoglobin content; increased nonprotein nitrogen, dextrose and potassium content of the blood; reduced alkali reserve, chloride and oxygen content, and delayed coagulability of the blood. When this condition is induced experimentally

From Jefferson Medical College.
1. Ebbecke, U.: Ueber Gewebsreizung und Gefässreaktion, Arch. f. d. ges. Physiol. 199: 197, 1923.
2. Krogh, August: Anatomy and Physiology of the Capillaries, New Haven, Conn., Yale University Press, 1929.
3. Lewis, Thomas: The Blood Vessels of the Human Skin and Their Responses, London, Shaw & Sons, Ltd., 1927.
4. Landis, E. M.: Capillary Pressure and Capillary Permeability, Physiol. Rev. 14: 404 (July) 1934.
5. Moon, V. H.: Occurrence and Clinical Significance of Hemoconcentration, Ann. Int. Med. 13: 451 (Sept.) 1939.

by various means, an increased flow of lymph from the thoracic duct is an early and constant feature.

The circulatory deficiency which results from capillary atony is accompanied by a group of characteristic visceral pathologic changes (Moon⁶). These are capillovenous congestion in the thoracic and abdominal viscera, edema of soft tissues such as lungs and mucosae, effusions in serous cavities, and petechial hemorrhages in parenchymatous organs, in serous and in mucous surfaces. It will be noted that these features are directly related to capillary injury. They are morphologic evidences of capillary disorder.

Few conditions of disease have a more characteristic clinical picture, more typical physiologic disorder and more significant visceral changes than those depicted. They are the clinical and pathologic features which are distinctive of circulatory failure of capillary origin. They establish it definitely as a clinical entity. That syndrome may arise from a wide variety of causes, as will be shown presently, but its mechanism is probably the same in all instances. Most important in that mechanism are the reciprocal effects of the two major factors, capillary atony and anoxia.

TRAUMATIC SHOCK

The syndrome described may follow extensive surgical procedures or severe physical trauma. When it arises from such causes it has been called surgical, traumatic or wound shock. Its occurrence and management became a major problem for military surgeons during the World War. The British Medical Research Committee organized an intensive attack on the problem of shock, using cases of severe wounds as clinical material. Eminent surgeons and physiologists of Great Britain, France and the United States cooperated in the endeavor. Because of the number and qualifications of the investigators and the almost unlimited opportunity for observations on wounded men, this investigation is of outstanding significance.

The reports, summarized by Cannon,⁷ indicated that the absorption of "toxic" substances from areas of extensive injury was the major factor causing wound shock. Radical surgical procedures, such as débridement of wounds and the amputation of mangled limbs,

development of a wheal. Exactly the same effects result from pricking a minute amount of histamine into the skin.

Ebbecke⁸ made the pertinent observation that any agent which will produce a wheal, when applied locally to the skin, will produce the syndrome of shock if its effects are induced systemically. As examples, he showed that histamine, bacterial toxins, various poisons, "lymphagogues," peptone, proteins to which an indi-

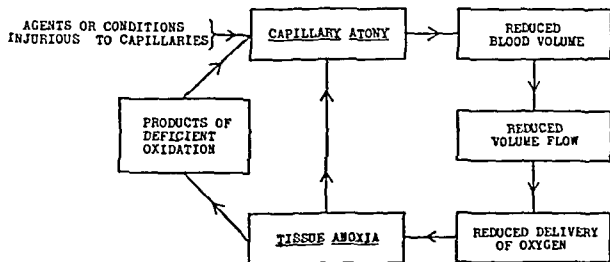


Fig. 2.—The vicious circle. For factors accessory to this mechanism see figure 5.

vidual is sensitive, and other agents will produce a wheal if applied locally. The same substances produced shock when injected intravenously. Likewise bee-sting venom, snake venom, bile, cholic salts, emetine, allyl formate and various other agents will produce wheals when applied locally and will cause shock when given intravenously. It appears that the effects of such agents are due to their action on capillary endothelium and that the difference between the local and the systemic effects is quantitative rather than qualitative. Ebbecke holds that wheals are analogous to shock in that the two result from the same condition—dilatation of capillaries and increased permeability of the endothelium.

It has been known for many years that aqueous extracts of normal tissues will produce immediate changes in arterial pressure if injected into the blood stream. Small doses of some of these will cause the pressure to rise while larger doses produce an effect like that of histamine. This effect is illustrated in figures 3 and 4.

It was once thought that the histamine present in normal tissues might be responsible for the decline in blood pressure caused by absorption from areas of trauma or by the injection of tissue extracts. That idea was not supported by Dale⁹ and his associates. They stated that the circulatory effect of histamine is like that of tissue extracts, bacterial toxins, peptone and other products of protein cleavage. But the amount of histamine present in normal tissues is too minute to produce the depressor effects noted.

Dale, Lewis and Krogh endorse the interpretation that shock resulting from extensive trauma or burns is caused by the absorption of substances released from injured tissues and by the effects of these on the visceral capillary stream bed. Cytoplasmic substance is not toxic in the sense commonly implied by that term. This fact modifies the original concept of traumatic toxemia—a modification which can be expressed distinctly by the clumsy phrase "traumatic a-toxic toxemia." A more exact designation would be "traumatic anoxia." For the

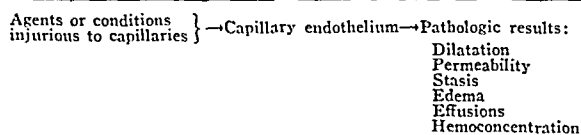


Fig. 1.—Pathologic effects of endothelial damage.

prevented the development of shock or caused early manifestations of it to disappear.

The explanation that traumatic shock results from the absorption of substances from damaged tissues was corroborated by subsequent investigations on the physiology and the reactions of the capillaries. Any type of injury to living cells causes the release of cytoplasmic substances which produce capillary reactions indistinguishable from those produced by histamine (Ebbecke, Lewis). Mild mechanical trauma to the skin causes the release of cytoplasmic substance. This produces increased capillary permeability locally, followed by the

6. Moon, V. H.: Shock and Related Capillary Phenomena, New York, Oxford University Press, 1938.

7. Cannon, W. B.: Traumatic Shock, New York, D. Appleton & Company, 1923.

8. Ebbecke, U.: Capillärerweiterung und Schock, Klin. Wehnschr. 2: 1725 (Sept. 17) 1923.

9. Dale, H. H.: The Activity of Capillary Blood Vessels and Its Relationship to Certain Forms of Toxemia, Brit. M. J. 1: 952 (June 9) and 1006 (June 16) 1923.

sake of accurate thinking, either the term traumatic toxemia should be avoided or, if used, the absence of any truly toxic factor should be understood.

A COMBINATION OF FACTORS

It was emphasized that shock occurring under conditions of warfare often results from a combination of factors rather than from a single one. These factors

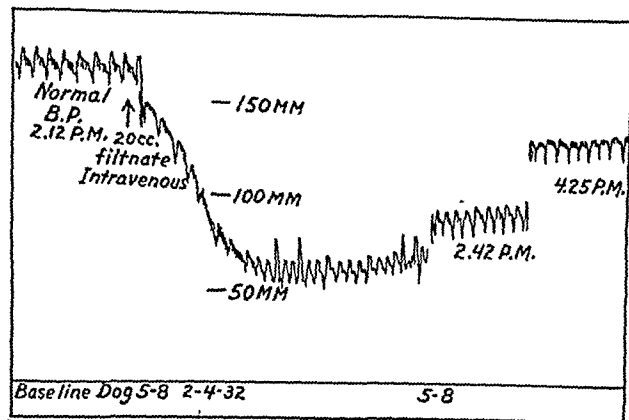


Fig. 3.—Effects on blood pressure resulting from the injection of a neutralized, fat-free, aqueous extract of normal dog muscle.

included absorption from injured areas, delay in operative treatment, anesthesia, hemorrhage, infection, exposure, exhaustion, cold and emotional reactions. Shock unaccompanied by significant hemorrhage was characterized by hemoconcentration, the degree of which was proportional to the degree of shock. When much blood had been lost by hemorrhage, hemodilution was noted. These cases responded well to transfusions or to the intravenous injections of saline solutions. Cases of severe shock from trauma were unresponsive to any form of treatment.

It should be emphasized that shock following accidental injuries is likewise the result of a combination of factors. Also the circulatory failure which arises after extensive surgical procedures combines the effects of the disease which necessitated the operation, the anesthetic, the trauma to various tissues, and such hemorrhage and loss of fluid as resulted from the operation itself. Although the surgeon may assume, in a given case, that one or another of these is the chief factor, it usually is not possible to secure definite evidence supporting the assumption or evaluating accurately the importance of the other factors.

Most of the methods used for producing shock experimentally likewise entailed combinations of confusing factors which rendered the results questionable. Highly important among these is anesthesia. Frequently a wounded soldier whose condition was not critical developed severe shock immediately when anesthetized for operation. Dale and Laidlaw¹⁰ found that the injection of histamine in doses of 1 or 2 mg. per kilogram caused fatal shock in cats anesthetized with ether. Unanesthetized cats often will survive ten times that dosage. The barbiturates, in the dosage used in animals for experimental purposes, frequently cause low blood pressure sometimes ending fatally. Gruber and Baskett¹¹ reported that moderate doses of barbitol compounds, from 0.05 to 0.5 Gm. per kilogram, caused a fall in blood

pressure in 162 of 164 animals tested. My personal experience supports the experience of others, that frequently a marked decline in blood pressure results from barbitol anesthesia independent of experimentation.

Hemorrhage and loss of fluid into injured or inflamed tissues is another complicating factor of importance. That extensive hemorrhage will cause a decline in blood pressure and other signs of shock is known by every one. In many of the experiments reported, the hemodilution which occurred before death, the extensive hemorrhages found in the traumatized areas and the pale and ischemic appearance of the viscera after death all supported the authors' contention that hemorrhage was the predominant factor in those experiments. However those experiments provided no means for evaluating the effects of absorption or of anesthesia. Experiments so arranged have little value in determining the relative importance of absorption, anesthesia and hemorrhage because those factors are indeterminably combined in the same experiment. A single formula containing three indeterminate variables is an absurdity, and proposed evaluations which disregard those variables are undependable.

Experiments of short duration are not suitable for evaluating the effects of absorption in causing circulatory disturbances. Secondary shock resulting from extensive damage to soft tissues, as seen in wounded soldiers, did not appear immediately but developed from four to twenty-four hours later. Shock resulting from the absorption of tissue substance implanted in the peritoneal cavity results fatally in from ten to thirty-six hours. In more than sixty experiments of this type the shortest interval between the implantation of the tissue pulp and the fatal outcome was ten and one-half hours (Moon).

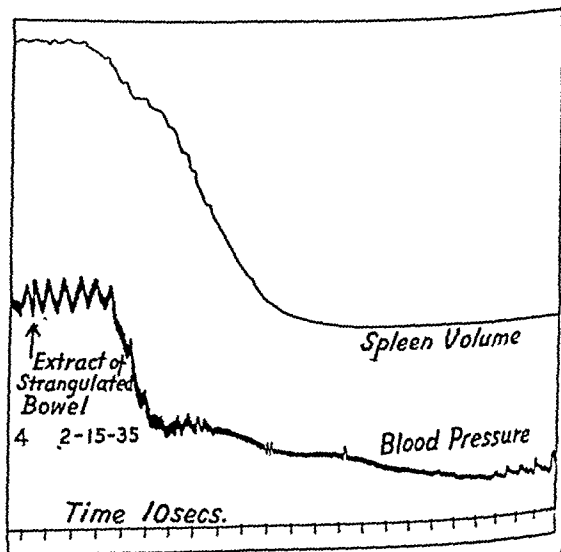


Fig. 4.—Effects of injecting a neutralized, fat-free, aqueous extract of intestinal mucosa. Note the sharp reduction of splenic volume. Apparently the spleen discharged its excess volume of blood, tending to counteract the circulatory deficiency.

When experiments on shock produced by trauma terminate in less than four hours, it is improbable that absorption of substances derived from damaged tissue is a significant factor. In such cases the circulatory deficiency arises chiefly from the effects of anesthesia plus the loss of blood and fluid into the traumatized areas, and perhaps from other factors.

A method commonly used in studies on shock is to narcotize an animal deeply with barbitol or a similar

10. Dale, H. H., and Laidlaw, P. P.: Histamine Shock, *J. Physiol.* 52: 355 (March) 1919.

11. Gruber, C. M., and Baskett, R. F.: The Effect of Phenobarbital (Luminal) and Sodium Phenobarbital (Luminal-Sodium) upon Blood Pressure and Respiration, *J. Pharmacol. & Exper. Therap.* 23: 234 (April) 1925.

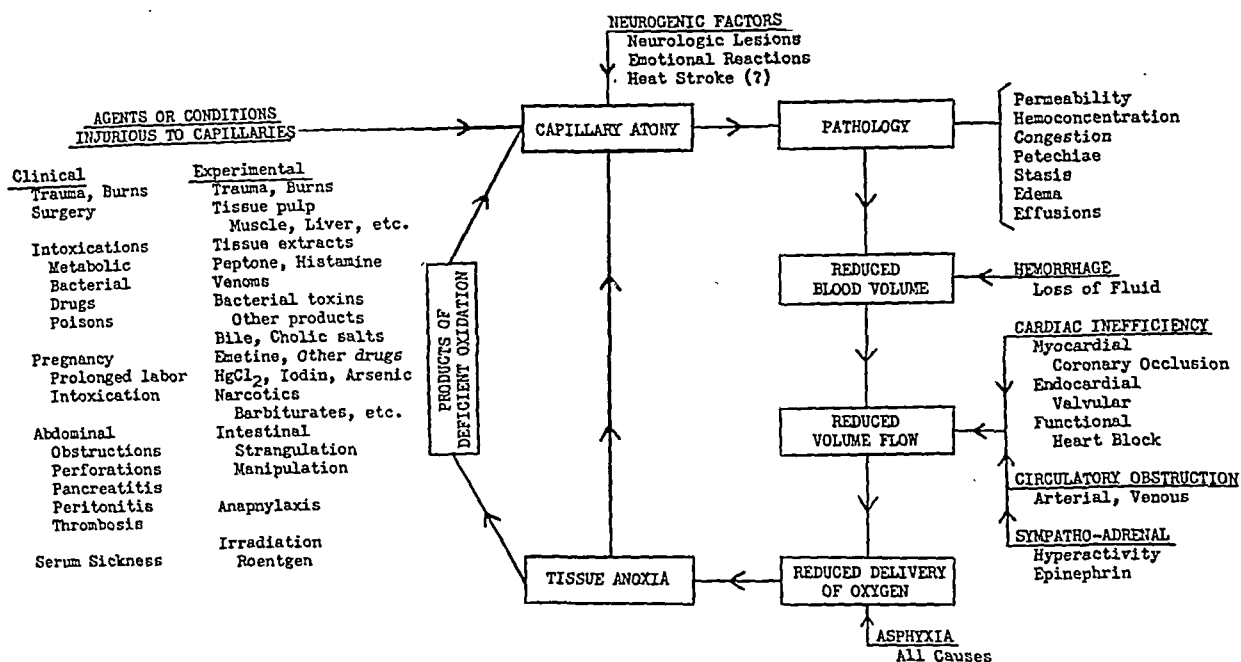


Fig. 5.—The vicious circle and accessory factors. For full explanation see the accompanying text.

drug. An arterial cannula is inserted, and the blood pressure and pulse rate are recorded kymographically through a manometer. Variations in these have been used as the sole criterion of shock in most of the experimental work reported. Shock is then induced by extensive trauma to the muscles, by prolonged manipulation of the intestines or by some other form of tissue abuse. Such methods are open to serious objections:

A decline in blood pressure is not an accurate criterion. It often results from other conditions and it does not occur early in shock but appears only after both blood volume and volume flow have been reduced.

The deep narcosis used often causes low blood pressure and other shocklike manifestations.

Variable amounts of blood and fluid are lost incident to the trauma. In some reports the workers showed convincing evidence that they were dealing almost entirely with hemorrhage.

Under such conditions of experimentation the recorded phenomena may be due to the narcotic, to absorption, to the associated hemorrhage or in part to each. This combination of indeterminate factors has contributed to undependable conclusions and to confusion.

THE MECHANISM OF CIRCULATORY FAILURE OF CAPILLARY ORIGIN

As stated in a preceding section, circulatory failure of capillary origin results from a disparity between the volume of blood and the volume capacity of the vascular system. That disparity results from the reciprocal effects of two major factors: capillary atony and tissue anoxia. Several secondary factors are concerned in the self-perpetuating cycle which develops when either capillary atony or tissue anoxia arises from any cause. These factors, their origin and their relationship to the vicious circle of shock can best be presented diagrammatically (fig. 5).

It is seen that a wide variety of clinical and experimental conditions may cause capillary atony and may thereby give rise to circulatory deficiency of capillary origin. I have included under clinical conditions only

those with which I have had personal experience. These presented the clinical picture of shock or collapse, and the postmortem appearances were those regularly found after death by shock. Also under experimental conditions only those agents have been listed which I have used experimentally. In each instance these agents produced progressive circulatory deficiency accompanied by hemoconcentration and by the congestive visceral changes which are characteristic of circulatory failure of capillary origin. Undoubtedly many other conditions, both clinical and experimental, should be added to those listed.

The diagram is largely self explanatory, but a few comments may clarify certain points which otherwise might be obscure. It is known that lesions of the central nervous system, such as hemorrhages, trauma, abscesses or neoplasms, may produce shocklike manifestations. The circulatory disturbance arising from such causes is accompanied by hemoconcentration, and the postmortem manifestations are of the same pattern as has been described. It is apparent that the tonus of the capillary stream bed is subject to influences of central nervous system origin, but the relationship of these to capillary reactions and tonus is obscure. Many surgeons have commented on fright, apprehension and other emotional reactions as causes contributory to shock, but the physiologic mechanism of this effect has not been shown.

Heat stroke is followed by circulatory collapse of the type under discussion. Hill¹² observed that "at post-mortem the organs of a case of heat stroke show capillary congestion as in wound shock." Le Count¹³ confirmed these observations. The exact mechanism by which heat stroke causes death is not known but many believe it to be through effects on the central nervous system. These factors are illustrated in the diagram as producing capillary atony directly, although

12. Hill, Leonard: The Physiological Aspect of Heat Stroke, Brit. M. J. 1: 397 (March 20) 1920.

13. Gauss, H.; Meyer, K. A., and Le Count, E. R.: Heat Stroke. Report of One Hundred and Fifty-Eight Cases from Cook County Hospital, Chicago. Am. J. M. Sc. 154: 554 (Oct.) 1917.

the author recognizes that the effects may be exerted indirectly through some other medium.

The shock type of circulatory failure may originate in any one of the chief factors in the cycle as diagrammed. For example, a serious loss of blood or of fluid will reduce the blood volume, hence reducing the volume flow and the delivery of oxygen to the tissues, and will thereby initiate the action of the vicious circle. It is well known that the clinical condition which develops after severe hemorrhage presents most of the features which are characteristic of secondary shock. Many investigators (Blalock,¹⁴ Phemister,¹⁵ Freedlander,¹⁶ Harkins,¹⁷ O'Shaughnessy,¹⁸ Holt,¹⁹ Freeman²⁰ and their associates) have shown experimentally that hemorrhage will produce circulatory failure of the shock type. One of Freeman's experiments is significant in this connection. An anesthetized dog was reduced to a state of circulatory deficiency by the successive withdrawal of quantities of blood. This blood was preserved in an uncoagulated state. When the animal's blood pressure had been low for some time, the reinjection of the entire volume of blood which had been withdrawn did not restore circulatory efficiency. This experiment illustrates the fact that the vicious circle of shock can be initiated by direct loss of blood, resulting in an irreversible circulatory deficiency.

It should be emphasized that hemorrhage operates by reducing the oxygen-carrying capacity of the blood. This effect results only when the erythrocytes and hemoglobin are reduced below 35 per cent of normal. This condition can be detected readily by the hemodilution which accompanies it. A transfusion of blood will restore circulatory efficiency in such a case if given before tissue anoxia has developed in a degree sufficient to cause capillary atony systemically.

Hemorrhage and loss of fluid into the traumatized tissues may be a factor of great importance after extensive trauma. Any loss of blood or of fluid is of consequence when circulatory deficiency threatens. Its importance will be proportional to the amount of blood and/or fluid lost. However it is unsafe to conclude that, because hemorrhage and loss of fluid will produce shock, all shock results from hemorrhage and loss of fluid.

The operation of the vicious cycle may be initiated by agents which reduce the volume flow of blood. Any marked reduction of volume flow will reduce correspondingly the delivery of oxygen to the tissues, thereby producing tissue anoxia and subsequent capillary atony. The characteristic clinical syndrome of shock is produced when, as a result of coronary occlusion not immediately fatal, the heart's action becomes inefficient.

This duplicates shock from other causes in every particular. The postmortem observations after such a fatality are the same as in other conditions of circulatory failure of capillary origin. The vicious circle arising from cardiac inefficiency operates in the same manner as if it originated otherwise.

Reduced volume flow produced by retarding the circulation will also initiate the operation of the vicious circle. Cannon and Cattell²¹ applied adjustable pressure, by a mechanical device, to the outer surfaces of the heart. This limited its diastolic filling and decreased the minute volume output. When low arterial pressure had been maintained for some time, the obstruction was removed, but the circulatory deficiency progressed to a fatal termination. Janeway and Jackson,²² and Erlanger and his associates,²³ retarded the systemic circulation mechanically by adjustable clamps on the vena cava and, in other experiments, on the aorta. After varying periods of time the clamps were removed but the circulatory deficiency, thus initiated, progressed fatally. Erlanger reported the same evidences of capillary stasis in these cases as in shock resulting from epinephrine or from tissue abuse.

Swingle and his associates²⁴ showed that adrenalectomy will cause the development of the complete syndrome of shock in dogs, and that injections of adrenal cortex extract will prevent shock or will cause it to abate in adrenalectomized animals. Later they showed that one function of the cortical hormone is to maintain the normal tonus of capillary endothelium. Deficiency of this function, resulting in capillary atony, explains satisfactorily the development of circulatory failure in adrenalectomized animals. However, these authors refrained from concluding that, since lack of cortical hormone will cause shock, such lack is the sole cause or even a major cause for shock.

It has been suggested (Freeman) that hyperactivity of the sympatho-adrenal system, excited by pain, irritation to tissues or emotional reactions, may result in maximal arterial constriction. This, if long sustained, might reduce the delivery of oxygen sufficiently to cause tissue anoxia and thereby to initiate the operation of the same vicious circle. This theory received support from the fact that epinephrine, given in large doses or in smaller amounts by continuous infusion, will produce the complete clinical and pathologic picture of shock.

However, it has not been demonstrated that the amount of epinephrine necessary to produce shock could be derived from the animal's own adrenal glands. It has been shown (Swingle and his associates) that adrenalectomized animals, maintained in a normal physiologic state by adrenal cortex extract artificially supplied, may be thrown into shock readily by the various agents which are used to produce that condition. Also it has been shown (Freedlander and Lenhart) that shock may be induced in animals which have recovered from bilateral sympathectomy as easily as in normal animals. The influence of the sympatho-adrenal system is eliminated in such experiments as described. It would appear that hyperactivity of the sympathetic

14. Blalock, Alfred: Shock Following Hemorrhage, *Arch. Surg.* 15: 762 (Nov.) 1927; Experimental Shock: The Cause of the Low Blood Pressure Produced by Muscle Injury, *ibid.* 20: 959 (June) 1930; Experimental Shock: The Probable Cause for the Reduction in the Blood Pressure Following Mild Trauma to an Extremity, *ibid.* 22: 598 (April) 1931.

15. Parsons, Eloise, and Phemister, D. B.: Hemorrhage and Shock in Traumatized Limbs: Experimental Study, *Surg., Gynec. & Obst.* 51: 196 (Aug.) 1930.

16. Freedlander, S. O., and Lenhart, C. H.: Traumatic Shock, *Arch. Surg.* 25: 693 (Oct.) 1932.

17. Harkins, Henry N.: The Bleeding Volume in Severe Burns, *Ann. Surg.* 102: 444 (Sept.) 1935; Experimental Burns: The Rate of Fluid Shift and Its Relation to the Onset of Shock in Severe Burns, *Arch. Surg.* 31: 71 (July) 1935.

18. O'Shaughnessy, Laurence, and Slome, David: Etiology of Traumatic Shock, *Brit. J. Surg.* 22: 589 (Jan.) 1935.

19. Holt, R. L., and Macdonald, A. D.: Observations on Experimental Shock, *Brit. M. J.* 1: 1070 (June 16) 1934.

20. Freeman, N. E.: Decrease in Blood Volume After Prolonged Hyperactivity of the Sympathetic Nervous System, *Am. J. Physiol.* 103: 185 (Jan.) 1933. Freeman, N. E.; Shaw, J. L., and Snyder, J. C.: Peripheral Blood Flow in Surgical Shock: Reduction in Circulation Through Hand Resulting from Pain, Fear, Cold and Asphyxia, with Quantitative Measurements of Volume Flow of Blood in Clinical Cases of Surgical Shock, *J. Clin. Investigation* 15: 651 (Nov.) 1936.

21. Cannon, Walter B., and Cattell, McKee: Experimental Traumatic Shock. The Critical Level in a Falling Blood Pressure, *Arch. Surg.* 300 (March) 1922.

22. Janeway, H. H., and Jackson, H. C.: The Distribution of Flow in Shock, *Proc. Soc. Exper. Biol. & Med.* 12: 193, 1914-1915.

23. Erlanger, Joseph; Gesell, Robert; Gasser, H. S., and Ellen, F. L.: An Experimental Study on Surgical Shock, *J. A. M. A.* 69: 1 (Dec. 22) 1917.

24. Swingle, W. W.; Pfaffner, J. J.; Vars, H. M.; Pett, P. A.; Parkins, W. M.: The Function of the Adrenal Cortex in Hemorrhagic Shock, *Proc. Soc. Exper. Biol. & Med.* 77: 15 (Oct.) 1933.

Swingle, W. W.; Parkins, W. M.; Taylor, A. R.: The Cause of Death from Adrenal Insufficiency, *Science* 77: 15 (Oct.) 1933.

Swingle, W. W.; Parkins, W. M.; Taylor, A. R.: The Cause of Death from Adrenal Insufficiency, *Science* 77: 15 (Oct.) 1933.

adrenal system is not an adequate explanation for shock resulting from the usual causes.

A series of recent experiments (Moon, Kornblum and Morgan²⁵) have a direct bearing on shock resulting from absorption from injured areas, independent of sympatho-adrenal activity. It is well known that high voltage abdominal roentgen therapy may be followed, after an interval of several days, by severe circulatory deficiency. Clinicians and roentgenologists have commented (Rolleston²⁶ for review) that irradiation sickness closely resembles shock resulting from extensive burns, intestinal obstruction, anaphylaxis or trauma. A group of dogs were subjected to deep abdominal roentgen irradiation. The results confirmed those of others (Hall and Whipple²⁷) that manifestations of shock develop not immediately but after an interval of several days. The circulatory deficiency was accompanied by hemoconcentration like that produced in various other types of experiments. After death the visceral appearances were of the same pattern as in shock originating otherwise.

My associates and I have confirmed the observations of Hall and Whipple that exposure to x-rays, as described, results in delayed necrosis of the intestinal mucosa. It appears that the resulting circulatory disturbances are produced by the absorption of cellular substances from the degenerated and necrotic mucosa.

Experiments of this type eliminate pain and emotional reactions, as well as hemorrhage and anesthesia, as possible factors. It would be difficult to explain shock resulting from irradiation on the basis of hyperactivity of the sympatho-adrenal system.

Asphyxia, from whatever cause, produces tissue anoxia directly. If this is gradual in onset, it results in clinical manifestations like those which characterize shock arising from various causes. This is seen in cases of carbon monoxide or illuminating gas poisoning of severe degree but not immediately fatal. It may be duplicated experimentally by causing animals to inhale inert gases or by limiting gradually the supply of oxygen in a closed cabinet. The visible evidences of capillary damage after death by asphyxia are the same as those resulting from capillary atony originating otherwise.

The instances given illustrate the fact that circulatory deficiency of capillary origin may arise in any one of the secondary factors shown in the diagram. These secondary factors directly or indirectly cause the development of tissue anoxia and thereby introduce a self-perpetuating quality because of the reciprocal action of the two primary factors—capillary atony and tissue anoxia.

The Mechanism of Water Balance and of Absorption.—Animal bodies are provided with a delicately balanced mechanism for regulating the transfer of water between the blood and the tissues in either direction. The tissues constitute a reservoir from which fluid may be drawn into the blood as needed. When much fluid has been lost as by vomiting, diarrhea or perspiration, the water supply being limited, the tissues become dehydrated but the water content of the blood is not notably affected. This is true only so long as the mechanism of "water balance" is functioning. That mechanism depends on a number of factors, including capillary blood pressure,

colloidal osmotic pressure, electrolytes, molecular and ionic concentrations, hormonal substances and perhaps other agents. But the action of these forces in preserving physiologic relationships between the intravascular and extravascular fluids is absolutely conditioned on the presence of a normal semipermeable membrane—the endothelium—between them. Capillary walls so altered from their physiologic state that they allow whole plasma to leak out into tissue spaces are incapacitated for creating or maintaining a normal differential between the composition of intravascular and extravascular fluids. The entire mechanism of water balance is thrown out of gear by a serious alteration in the permeability of the endothelial membranes.

The absorption of fluid from the gastrointestinal tract or from tissues depends on normal capillary function. The thirst which accompanies shock expresses the call of the blood for fluid. But efforts to supply it, either by mouth, by rectum or by hypodermoclysis, are ineffective if the circulatory deficiency has progressed to an advanced stage. Fluid given by mouth is soon vomited or is not absorbed; likewise that given by rectum or by injection. Underhill²⁸ and others have shown that animals about to die of shock resulting from burns of the skin may be injected subcutaneously with lethal doses of strychnine without effect. Normal controls, similarly injected, died from the effects of strychnine before the burned animals died of shock. Such observations and experiments indicate that the mechanism both of water balance and of absorption is seriously deranged when capillary atony has developed extensively or when the circulatory deficiency of shock has reached an irreversible stage.

SUMMARY

Circulatory failure of capillary origin produces a clinical syndrome which is highly characteristic. This is accompanied by an equally characteristic group of abnormal physiologic and biochemical features. These constitute the clinical syndrome of shock.

The gross and microscopic changes seen post mortem are equally significant. These consist of evidences of capillary damage, such as dilatation, stasis, petechial hemorrhages, edema and effusions, present in extensive visceral areas. These features are etiologically related to the mechanism by which circulatory deficiency of capillary origin develops.

Hemoconcentration is a highly valuable clinical sign indicating the early stages of this condition. It occurs before other signs of circulatory deficiency are manifest.

The mechanism of this type of circulatory failure includes the reciprocal effects of two major factors—capillary atony and tissue anoxia. Either of these factors will presently cause the development of the other. This reciprocal action gives the circulatory deficiency a self-perpetuating quality which tends toward an irreversible condition.

Few conditions of disease present a more characteristic group of clinical features, physiologic abnormalities and morphologic visceral changes. This syndrome, if caused by a single etiologic agent, would constitute an entity among diseases. But the origin of this syndrome is highly diversified.

It may originate from the numerous and varied agents and conditions which may injure directly the capillary endothelium, from loss of blood and/or fluid sufficient to produce systemic anoxia, from agents or

25. Moon, V. H.; Kornblum, Karl, and Morgan, D. R.: *The Nature and Pathology of Irradiation Sickness*, to be published.

26. Rolleston, Humphry: *Critical Review: Harmful Effects of Irradiation X-Rays and Radium*. *Quart. J. Med.* 23: 101 (Oct.) 1930.

27. Hall, C. C., and Whipple, G. H.: *Roentgen Ray Intoxication: Disturbances in Metabolism Produced by Deep Massive Doses of Hard Roentgen Rays*, *Am. J. M. Sc.* 157: 453 (April) 1919.

28. Underhill, F. P.; Carrington, G. L.; Kapsinow, Robert, and Pack, G. T.: *Blood Concentration Changes in Extensive Superficial Burns and Their Significance for Systemic Treatment*, *Arch. Int. Med.* 32: 31 (July) 1923.

conditions which reduce the volume flow of blood below physiologic limits, from asphyxia of external or internal origin or from various combinations of the conditions mentioned.

Efforts to combat this type of circulatory deficiency will be directed toward the recognition and removal of the cause and toward interrupting the operation of the vicious circle. If the former cannot be accomplished, the latter will be ineffective.

Until some agent is found which will prevent or relieve capillary atony, efforts to interrupt the cycle should be directed toward the restoration of blood volume and toward relieving the anoxia. The tendency to progress toward irreversibility requires early recognition and action. Hemoconcentration is recommended for recognizing the early stages of circulatory deficiency of this type.

THE DURATION OF REMISSION IN PERNICIOUS ANEMIA WITH LIVER THERAPY

THE EFFICACY OF MASSIVE DOSES
ADMINISTERED AT ONE TIME

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AND

FREDERICK J. POHLE, M.D.

BOSTON

Dosage of liver extracts used in the treatment of pernicious anemia has been discussed at length and no longer presents a serious problem. What the time interval between injections of liver extract should be has scarcely been studied. The present availability of highly concentrated liver extracts for general use in the treatment of pernicious anemia makes this problem one of considerable practical importance. One can easily inject at one time as many U. S. P. units of liver extract as have been found necessary for maintenance over a period of from six to twelve months when given in divided doses at frequent intervals. Such a procedure, although it may produce temporary local discomfort, would be convenient for the patient and would save considerable time. A study of four patients by Miller¹ in 1936 suggested the feasibility of such a method of treatment, and observations made by several members of this medical unit during the past seven years have suggested that this type of therapy might be useful.

Convenient though such a procedure might be, it must be remembered that it does not seem physiologically ideal. One would hardly endeavor to prevent scurvy or rickets by the monthly administration of a gallon of orange juice or a pint of cod liver oil. Since pernicious anemia is a form of starvation (that is, starvation as far as the specific antianemic material is concerned) the daily administration of the missing material would more closely simulate physiologic conditions. Certainly normal human beings manufacture their own "liver extract" daily, and with oral liver or stomach therapy the daily method of treatment is customary. Parenteral liver therapy has many advantages

over oral treatment and is today the method of choice. Patients who receive injections always desire to make the intervals between treatments as long as possible.

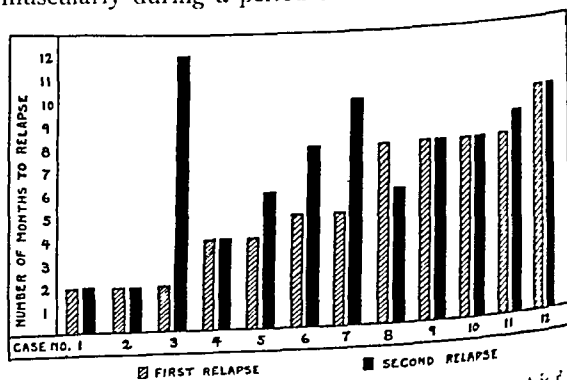
The following observations were made in an endeavor to determine the capacity of the patient with pernicious anemia to store injected liver extract in excess of the immediate requirements and to determine whether rapid depletion or lack of utilization of such stored material might render large injections at long intervals unfeasible.

OBSERVATIONS

Fifteen patients with classic Addisonian pernicious anemia, none of whom had significant spinal cord involvement or, at the time, any other symptoms attributable to pernicious anemia and who had maintained an erythrocyte level of 4,500,000 cells per cubic millimeter or higher for an average period of three years, were selected for study. These patients had received intramuscularly during this period 10 cc. of a liver extract² prepared according to the directions of Strauss, Taylor and Castle³ every four weeks. These particular patients were chosen because of the relatively small amount of liver extract which they required for maintenance and because they did not have serious central nervous system involvement. Thereafter all liver therapy was omitted.

Three of the fifteen original patients showed no signs of anemia until nineteen, twenty-six and twenty-seven months, respectively, after liver therapy was stopped. These three patients were not studied further but received routine liver extract therapy, which quickly produced remission.

The remaining twelve patients developed anemia with a red blood cell count on two or more consecutive examinations of 4,000,000 cells per cubic millimeter or less within a period of ten months as shown in the chart. At the time of relapse each of these twelve patients received 160 cc. of the same liver extract intramuscularly during a period of one week. This dose of



The duration of remission in pernicious anemia after treatment is continued. Cross hatched bars represent length of time to relapse after discontinuance of monthly injections of 10 cc. of liver extract. Solid bars represent length of time to relapse after single massive injection of 160 cc. of liver extract (1 cc. of extract equivalent to approximately 1 U. S. P. unit).

160 cc. was 30 cc. more than the amount which had been given in divided doses over a period of a year, during which time these patients' red blood cells had remained at essentially normal levels. The additional 30 cc. was known to be an amount sufficient to produce

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School.

1. Miller, F. R.: Effect on Pernicious Anemia of Massive Doses of Parenteral Liver Extract, *Proc. Soc. Exper. Biol. & Med.* 33:580 (Jan.) 1936.

2. Although the Advisory Committee of the United States Pharmacopeia has not assigned a unit value to this material, we judge from observations that 1 cc. contains approximately 1 unit. F. H. Taylor & Co., Indianapolis, supplied this material.

3. Strauss, M. B.; Taylor, F. H. L., and Castle, W. B.: Parenteral Use of Liver Extract, *J. A. M. A.* 97:313 (Aug. 1) 1931.

a complete return to normal blood levels from the relatively slight anemia that had developed in the period without treatment.

After this massive dose each of these twelve patients was observed at intervals of four weeks, but no further liver therapy was administered. Each patient had 5,000,000 erythrocytes or more per cubic millimeter within a month after this large dose of liver extract. Relapse again occurred in these twelve patients at intervals varying from two to twelve months, as indicated in the chart. In general, the length of the remission appeared to be a function of the individual patient rather than of the treatment. However, patients 3 and 7 are worthy of special comment. The former relapsed the first time within two months after the maintenance liver injections were stopped but did not relapse after massive therapy for twelve months, and the latter had a ten months remission after massive therapy compared with five months in the first instance.

COMMENT

Richter, Ivy and Kim⁴ in 1932 demonstrated that the liver of a patient with treated pernicious anemia contained as much "liver extract" as a normal liver, whereas the liver of a person dying of untreated pernicious anemia contained no demonstrable amount of this material. Thus there appears to be no difficulty in storage of liver extract in the liver and, by inference, in the kidneys and other organs of the patient with pernicious anemia. The fact that many of the patients relapsed in a relatively short period of time after liver extract therapy was omitted may be taken to indicate either that they failed to store the excess liver extract injected or that depletion occurred independently of the requirements for blood formation. Patients 3 and 7 may be exceptions or may represent chance variation. If the physiology of liver extract is analogous to that of thiamin (vitamin B₁), both storage and depletion are involved. It has been shown that the daily excretion of thiamin in the urine and feces of animals⁵ increases in direct proportion to the daily intake to such an extent that at very high levels of intake there is almost 100 per cent excretion. Furthermore, when animals previously receiving adequate diets are deprived of thiamin,⁶ four fifths of the thiamin stored in the liver is depleted, chiefly by excretion, within a week.

Whatever the mechanism involved, the observations recorded in this communication indicate that the majority of patients, even those with uncomplicated pernicious anemia, cannot be safely treated by injections of liver extract at long intervals even if massive amounts are given. Since two of the twelve patients had already relapsed in eight weeks, it seems probable that injections should be given at intervals not longer than half this period; that is, four weeks. As a matter of clinical judgment, it appears that shorter intervals are frequently advantageous so that treatment should be given at from one to four week intervals, depending on the individual case. This does not imply that patients cannot maintain remissions without treatment for longer periods of time. Indeed, before liver therapy was introduced remissions lasting for two or three years were not unknown, although after "spontaneous" remission, which occurred in the majority of cases, 24 per cent of

patients again relapsed within three months, while 51 per cent had remissions lasting longer than six months.⁷

A comparison of the length of time before relapse occurred in our series with that in Cabot's⁷ series of "spontaneous" remissions is shown in the table. However, it must be remembered that in very few spontaneous remissions did the red cell level reach 5,000,000 cells per cubic millimeter and relapse usually meant counts of 3,000,000 cells per cubic millimeter or less. In fact, a patient with pernicious anemia who maintained a level of 3,500,000 to 4,000,000 cells per cubic millimeter was considered to be getting along very well in remission, whereas we have taken this level to indicate relapse. If one bears these facts in mind, it appears that the duration of "liver induced" remission after treatment is omitted does not differ strikingly from that after "spontaneous" remission.

If the three patients who did not relapse after treatment was omitted for from one and one half to over two years had been kept under routine treatment, one might have concluded that it was the treatment which was solely responsible for their satisfactory maintenance in remission.

Percentage of Patients with Pernicious Anemia Showing Relapse

Time Required for Relapse	Cabot's Series, Percentage	Present Series, Percentage	
		Relapse After Omission of Monthly Maintenance Injections	Relapse After Massive Single Dose
1-3 months.....	24	20	16
3-6 months.....	25	27	25
More than 6 months....	51	53	59

Furthermore, should an attempt be made to determine the potency of a liver extract by its effect in maintaining satisfactory erythrocyte levels, cases such as these might lead to extremely erroneous conclusions. An even more extreme case is represented by a patient with typical pernicious anemia who received 10 cc. of the liver extract, given the patients already cited, in August 1932, at a time when his erythrocytes numbered 800,000 per cubic millimeter. This had been his third relapse supposedly due to previously inadequate treatment. Nevertheless, after this single injection his erythrocyte level rose to 5,000,000 per cubic millimeter and remained there without further treatment until 1938. Although it is of course rare to encounter this in a case of such severe anemia, we know of at least three other similar cases. It is to be emphasized that the observations recorded in this paper were made on subjects who had rather mild and uncomplicated pernicious anemia and who required relatively little liver extract to maintain normal blood levels. Patients with spinal cord involvement, chronic infections or nitrogen retention and those who for no ascertainable reason require much larger amounts of liver extract for maintenance will generally suffer from relapse much sooner after liver therapy is omitted. Significant declines in erythrocyte levels may occur in such cases within a few weeks.

CONCLUSIONS

1. Patients with pernicious anemia who require relatively little liver extract to maintain a normal blood level may relapse in as short a time as two months after liver therapy is omitted.

4. Richter, Oscar; Ivy, A. C., and Kim, M. S.: Action of Human "Pernicious Anemia Liver Extract," *Proc. Soc. Exper. Biol. & Med.* 29: 1093 (June) 1932.

5. Westerbrink, H. G. K.: Ueber den Gehalt an Vitamin-B₁-freier Ernährung, *Arch. neerl. de physiol.* 17: 560, 1932.

6. Leong, P. C.: Vitamin B₁ in the Animal Organism, *Biochem. J.* 31: 373 (March) 1937.

7. Cabot, R. C.: Pernicious and Secondary Anemia, Chlorosis and Leukemia, in Osler, William: *Modern Medicine*, ed. 3, reedited by Thomas McCrae and E. H. Funk, Philadelphia, Lea & Febiger, 1927, vol. 5.

2. The majority of patients with pernicious anemia cannot be satisfactorily treated by the use of massive doses of liver extract given at intervals of several months.
3. The optimum interval between injections for most patients with pernicious anemia is from one to four weeks.
4. The difficulties involved in determining the potency of liver extracts by their maintenance effects are obvious.

DILANTIN SODIUM IN THE TREATMENT OF EPILEPSY

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ST. LOUIS

In August 1938 I began to use dilantin sodium in the treatment of epilepsy, gradually adding patients as I went along. This report concerns forty-eight cases. The patients were not selected but rather were chosen at random. They were of all ages, the etiology in all of the cases being unknown. All of these patients had received either phenobarbital or bromide or both for long periods, but the convulsions continued despite this form of medication. Various forms of diet were also tried at various times but without improvement. At the time of this writing all of the patients have the same diet. The duration of their epilepsy varied from one to thirty-one years and the frequency of convulsions from one to seventy-four a month, and many of the patients suffered from attacks of both grand and petit mal. All of the patients who were following

this reaction should be expected in the cases reported as phenobarbital and bromides had been given in almost the entire duration of the epilepsy, some receiving these sedatives for as long as thirty-one years. During the phenobarbital and bromide treatment the patients were irritable and pugnacious.

Dilantin sodium medication was started with doses of 0.1 Gm. three times a day with meals. If the doses are not taken with meals the patient is almost sure to complain of nausea. If on the initial dose the patient continued to have convulsions, the dose was increased to 0.1 Gm. at a time, with one week between the increases until the convulsions were controlled or the patient complained of toxic symptoms or showed toxic signs. The most frequent complaints of toxicity were dizziness, nausea and sometimes vomiting. The most noticeable sign was a staggering gait. The toxic signs and symptoms were more frequent in children.

Hyperplasia of the gums, as reported by Kimball, was seen in thirty of our forty-eight patients. Of these thirty patients, one had extreme and six moderately advanced hyperplasia, and twenty-three showed a moderate amount. It appears that the higher the dose of the drug, the more advanced the hyperplasia. The ascorbic acid content of the blood also showed a decrease in proportion to the increase in hyperplasia.

The symptoms usually found in prolonged and severe cases of vitamin C deficiency, such as purpura, sore joints and extreme weakness, have not been seen.

Psychic disturbances were seen in five patients, but I am inclined to believe that this was brought about by the withdrawal of the sedatives. One of these patients, who remained under treatment with the drug

Observations in Some Noteworthy Cases

Patient	Age	Duration of Disease, Yr.	Minimum Monthly Seizures	Maximum Monthly Seizures	Daily Dose, Gm.	Result: Seizures Since Start of Dilantin Sodium Therapy	Duration of Treatment with Dilantin Sodium, Mo.	Hyperplasia	Ascorbic Acid, Mg. per 100 Cc. Blood
J. S.	27	15	3	74	0.6	Free	8	Extreme	0.137
C. F.	40	27	19	44	0.3	Free	7	None	0.637
R. S.	33	4	8	10	0.4	Free	8	None	0.556
S. C.	10	1	1	2	0.3	Free	6	None	0.329
P. B.	33	31	1	11	0.3	Free	6	Moderate	0.344
A. Y.	18	3	1	1	0.3	Free	4	None	0.311
W. W.	28	3	1	4	0.3	Free	5	Slight	0.555
G. G.	20	5	0	12	0.6	Free	4	Moderate	0.271
E. J. O.	19	18	3	11	0.4	Free	3	Slight	0.241
J. B. R.	3	2	1	6	0.4	Free	3	Slight	0.241
G. S.	35	16	1	3	0.3	Free	9	Moderate	0.291
A. T.	26	16	1	9	0.3	2*	8	Slight	0.297
C. H.	28	22	1	5	0.3	1*	5	None	0.642
P. F.	10	9	2	54	0.4	1*	9	Moderate	0.121

* Grand mal.

some form of occupation have continued to do so. All of the conditions which prevailed under the other forms of treatment were continued while they were under dilantin sodium treatment.

Of the forty-eight patients treated with this drug, nineteen, or 39 per cent, showed entire control of the convulsions, ten, or 21 per cent, showed definite alleviation, and nineteen, or 39 per cent, showed little or no benefit. Of this series of patients three have been taking this drug for less than four months.

There was considerable reaction when the phenobarbital and bromides were withdrawn, despite the fact that it was withdrawn very gradually. I believe that

has been free from convulsions for four months and no longer has any psychic disturbances. The other four patients were again placed under phenobarbital therapy, and their psychic disturbances disappeared.

All of the patients now receiving dilantin sodium have been examined repeatedly both physically and with laboratory tests, and nothing pathologic could be found that was traceable to the use of this drug.

REPORT OF THREE TYPICAL CASES

CASE 1.—J. S., a man aged 27, had suffered from grand mal attacks for the past fifteen years. The cause of the attacks is unknown. There had been an average of about forty attacks every month for the last five years. Immediately

J. Kimball, O. P.: Treatment of Epilepsy with Sodium Dilantin Hydatoinate, J. A. M. A. 112: 1244 (April 1) 1939.

the start of the treatment with dilantin sodium he had from one to four seizures every day. Sept. 8, 1938, a dose larger than I generally use was instituted because of the severity of involvement. The last seizure occurred September 9. While he was taking phenobarbital he was one of our meanest patients; he would cause fights, refuse to work and destroy property. Now he works steadily, is one of our best behaved patients and helps the attendants to quell fights. This change in personality is certainly something that one may look forward to in the future treatment of epilepsy with dilantin sodium. There was extreme hyperplasia of the gums. The ascorbic acid content was 0.137 mg. per hundred cubic centimeters of blood. This patient did not have much of a reaction when the phenobarbital was withdrawn. He has been free from seizures for nine months.

CASE 2.—C. F., a man aged 40, had his first attacks of grand mal at the age of 13. The seizures followed scarlet fever. He has had from two to as many as forty-four attacks a month. He had been on phenobarbital for about twenty years. Oct. 5, 1939, he was placed under medication with 0.3 Gm. of dilantin sodium a day and one-half grain (0.03 Gm.) of phenobarbital was withdrawn every day. Convulsions became more frequent and more severe, and October 8 I increased the dose to 0.4 Gm. daily. He continued to have seizures, but they seemed to be less intense and not as frequent. October 12 I increased the dose to 0.5 Gm. daily. During this period he complained of being very nervous, which I attribute to the withdrawal of the phenobarbital. November 9 he complained of various "funny feelings" and I added sodium bromide 5 grains (0.3 Gm.) four times a day. He continued to take the bromide along with dilantin sodium for one month, when the bromide was gradually withdrawn. In April 1939 he complained of nausea and dizziness. I immediately withdrew 0.2 Gm. of dilantin sodium from his daily dose, leaving 0.3 Gm., which up to this time seems to control the seizures. He has been free from convulsions for the last eight months.

CASE 3.—J. B. R., a girl aged 3 years, had been suffering from attacks of grand mal and petit mal for two years. There is a history of injury at birth, but examination so far has failed to reveal such a cause or any other possible cause for the epilepsy. She had been taking phenobarbital, but this did not control the convulsions. She had from one to six attacks of grand mal and from two to nine attacks of petit mal every month. Sept. 5, 1938, she was placed on a ketogenic diet. From October 17 until December 11 she had a definite state of ketosis. During this time she had eighteen attacks of grand mal and eight attacks of petit mal. December 18 the ketogenic diet was discontinued in the usual manner and the child had six grand mal attacks from Dec. 18, 1938, to Jan. 15, 1939. Starting on January 15 0.15 Gm. of dilantin sodium was given. She continued to have attacks, and the dose was increased to 0.3 Gm. From March 26, 1939, until the time of writing, a period of ninety days, she has had but one petit mal seizure, on May 15. During the treatment with dilantin sodium she has at times complained of nausea and shown an unsteady gait. She has a moderate degree of hyperplasia of the gums. The ascorbic acid content of the blood is 0.244 mg. per hundred cubic centimeters.

CONCLUSIONS

1. Dilantin sodium, besides being an effective anti-convulsant, has the advantage of not producing the sedative effect of the other anticonvulsants.
2. The personality of the epileptic patient treated with dilantin sodium is remarkably improved.
3. The deficiency in ascorbic acid content parallels to a certain degree the amount of hyperplasia of the gums.
4. Dilantin sodium has a very definite place in the treatment of epilepsy.

Further studies are being made, and their results will be reported at a later date.

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SYPHILIS CASE FINDING IN INDUSTRY

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The importance of case finding in syphilis has a parallel in tuberculosis, since these diseases have many things in common from a social and an economic point of view. They have their greatest incidence in the low income groups and among the uneducated, and for these two reasons the problem of control and eradication is all the more difficult. The steady decline of the death rate from tuberculosis marks the success of control measures of that disease; the number of deaths has decreased in direct proportion to the intensity of the antituberculosis work. It is known that syphilis can also be controlled, as the Scandinavian countries have given the world an excellent example of the effects of concerted effort to eradicate the menace of venereal diseases. It is fortunate that we have the example of the result of their experience in our present campaign.

The social and economic aspects of tuberculosis have long been recognized, and a systematized method of control has been worked out and applied fairly well throughout this country. There exist hospitals, dispensaries and personnel for case finding, diagnosis, treatment, education and rehabilitation, which are the well known methods employed in tuberculosis control campaigns. The results of the tuberculosis program are well known to all.

Most of the principles of the control programs in tuberculosis can be applied to the control of syphilis. Both are infectious diseases and therefore it is important to find the early infectious case, make proper diagnosis and isolate or quarantine until the infectious period is past. In the case of syphilis, the quarantine period can be made short by treatment. Patients are soon rendered noninfectious and are no longer a menace. Dr. Parran calls this "chemical quarantine." After the quarantine period, the cases of both tuberculosis and syphilis must be kept under treatment until they are past the period where relapses and serious complications might result in early death. This brings in the necessity of case holding, which is one of the difficulties in both instances.

The annual attack rate of syphilis per hundred thousand of population in the United States in 1935 was 796 compared with 47 in Great Britain (clinics only), 20 in Denmark and 7 in Sweden. In other words, there were proportionately more than a hundred times as many new cases of syphilis in the United States as there were in Sweden that year, as shown in figure 1. This demonstrates two things: First, syphilis can be controlled and, second, persons with infectious syphilis in this country are not being found, isolated and prevented from spreading the disease to others.

Much of the foregoing material deals with the infectious cases and the spread of syphilis. There is another group which is larger and presents serious problems. This group includes the cases of syphilis which have passed the infectious stages; it is from their ranks that

Read before the Second Annual Congress on Industrial Health, Chicago, Jan. 15, 1940.

the recruits are derived for the tragic late manifestations of this disease. The seriousness of any one of these conditions, it seems, more than amply justifies our program of finding these cases. You, as physicians, know that when patients pass through the early stages of syphilis they are unaware of the seriousness of their condition and need guidance and advice to effect a cure of the disease before some of the serious complications become evident. It has been estimated that there are more than 40,000 deaths annually from cardiovascular syphilis, which is more than half as many as there are from tuberculosis. One of each ten persons admitted to the insane hospitals has dementia paralytica, and their domiciliary care costs over \$31,000,000 annually. Another \$10,000,000 is spent each year for pensions and care of the syphilitic blind. Before the advent of the national campaign for the control of syphilis there were more than 60,000 syphilitic babies born each year in the United States, one third of whom, if untreated, will become either totally or partially blind.

"Syphilis," Surgeon General Thomas Parran says, "is now a major hazard to health and efficiency. Efforts to improve industrial hygiene must include more attention to syphilis control among workers. If each industry will take responsibility for knowing its own problem, for seeing that treatment is available, for continuing to give employment to those who seek a cure, the cost to the industry will be paid promptly in terms of reduced sickness losses and more efficient labor. The employees, their families and the community will benefit."

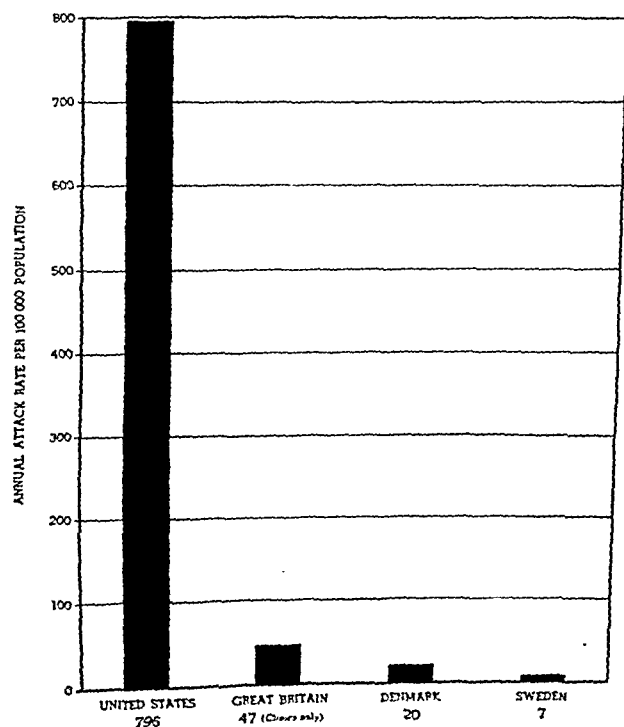


Fig. 1.—Incidence of syphilis in the United States, Great Britain, Denmark and Sweden in 1935.

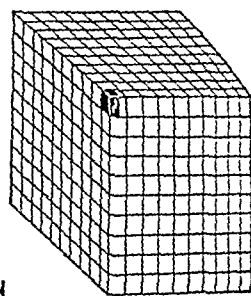
To discharge persons with syphilis, thereby denying them the right of an income, places a great burden on the worker, the community and the nation. The worker with syphilis needs an income to pay for the necessary treatment and he also needs the friendly advice and counsel of the plant physician. Without these requisites he does not receive the necessary measures to cure his

disease and in time, together with members of his family, he will most likely become a public charge. Industry will pay for such cases of syphilis in added taxes.

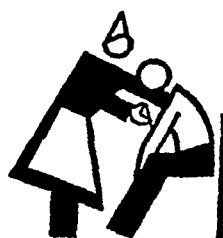
The further importance of syphilis control in industry is evident when it is realized that there are more than



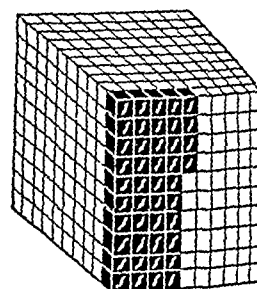
WASSERMANN ONLY WHEN
SYPHILIS IS SUSPECTED



6 OUT OF 1,000



ROUTINE WASSERMANN



44 OUT OF 1,000

PICTORIAL STATISTICS INC.

Fig. 2.—Why routine tests should be given. Figures from the American Social Hygiene Association.

15 million people employed in the mining, mechanical and metal trades. A syphilis program reaching these workers and members of their families will include about half of the population of the country.

The industrial syphilis control program, therefore, is an integral part of the whole national campaign. It is important from the point of view of the large number of persons involved and because of its function as part of the community control program, and also because the employees and employers working together harmoniously will influence greatly the direction and the progress of this campaign in every community throughout the nation.

The program recommended by the U. S. Public Health Service is one of case finding, treatment and education. It has worked out well in the industries which have engaged in syphilis control programs and has been met with enthusiastic response by manufacturers, union officials and employees. Experience has shown that it must be carried out on a cooperative and impartial basis in order to be successful.

The cooperative program for syphilis control in industry recommended by the Surgeon General of the United States Public Health Service is as follows:

1. Routine blood tests should be made on all employees at times of reexamination.
2. Routine blood tests should be made on all applicants for employment.

3. Patients with syphilis, if noninfectious, should be kept in employment and also accepted for work provided they agree to take the necessary treatment for syphilis. Those refusing treatment must be referred to the local health departments.
4. All persons with syphilis found by blood testing should be referred to the family physician for confirmation of the diagnosis and for treatment of the disease. If the worker is unable to pay for this service, he should be referred to clinics where diagnosis and treatment are available.
5. Strict confidence must be maintained between the plant physician and the worker regarding his condition.
6. Cases should be followed up by the plant physician and his staff to assure that the patient continues treatment and that adequate treatment is being received. If facilities are available, health departments may assist in the follow-up of cases.
7. An educational program should be developed which will teach the employees the facts about venereal diseases, how they are contracted, how they are spread and how they may be cured. The educational program should include information concerning prophylaxis.

In the program of case finding in industry, we are also concerned with promoting efficiency and the prevention of accidents. The interest of industry in the health of the worker has proved that it pays dividends in more than one way. As regards syphilis, the patients are better workers if their disease is treated, they change

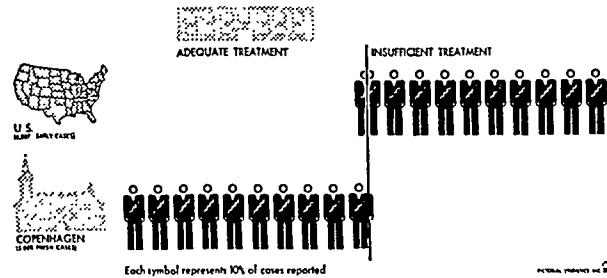


Fig. 3.—Completeness of treatment in the United States and in Copenhagen.

jobs less often and have fewer accidents. The hospital, legal and compensation costs are less.

The application of this program can be varied according to the local needs. In our experience, we have used several methods. In some cases the local health officer has taken the initiative and industry has cooperated. In others, the industry has taken the initiative and the health officer has cooperated. In such cases there is usually no full time plant physician. In other instances the workers have taken the lead in educational work and in inducing their fellow workers to consent to have blood tests made, the plant taking the blood for testing and doing the follow-up on treatment. In none of the plants cooperating with the U. S. Public Health Service are patients treated, but all are referred to their family physicians. When the income is low and the financial responsibility of a large family is great the patients are referred to the clinics where adequate treatment can be had.

On the whole, these methods have worked out well. The program has not been without difficulty in a few instances. One of these has been that the worker is afraid of losing his job. All of the industries cooperating, I believe, are acting in good faith with their workers. It has been necessary to do some educational work on the employer as well as the employee. Many employers thought that all syphilitic persons were infec-

tious and that they should be avoided, as in the case of leprosy. One manufacturer was happy to know differently and showed remorse over the injustice he had done in the past by discharging employees with syphilis. He said he would reemploy them as fast as possible and that no other patients, except those with

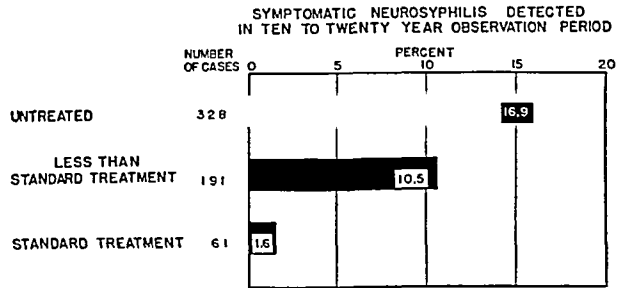


Fig. 4.—Probability of developing symptomatic neurosyphilis in treated and untreated syphilis.

infectious and cerebral involvement, would be discharged. The popular education on syphilis by the newspapers, magazines and radio has practically eliminated all this difficulty.

The nature of the disease syphilis makes it rather difficult to find the patients and to keep them under treatment long enough to effect a cure. There is no pain associated with the early stages in syphilis as there is in many diseases, and for this reason many infected persons do not realize the seriousness of their affliction. The disease passes through the first stages and becomes latent, usually without painful symptoms or inconvenience, and it is easily overlooked by ordinary physical examination without blood tests. The American Social Hygiene Society has presented some interesting data relative to case finding by routine blood tests. They showed that in the course of physical examinations where blood tests were made only when syphilis was suspected, 0.6 (six-tenths, or less than one) case was found per thousand compared with forty-four in 1,000 when routine blood tests were made. The ratio is about 1 to 73. This emphasizes the difficulty encountered in

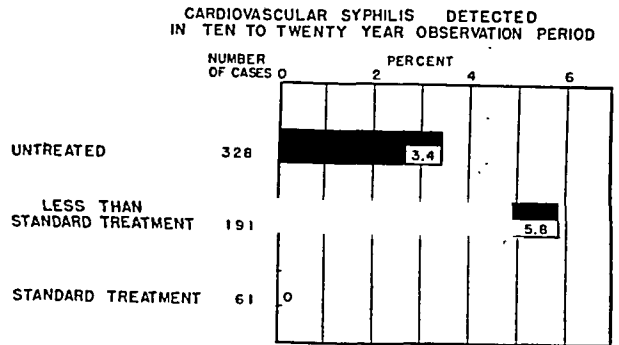


Fig. 5.—Probability of developing cardiovascular syphilis in treated and untreated syphilis.

attempting the diagnosis of syphilis by physical examination alone (fig. 2).

The case finding projects sponsored by the Public Health Service in cooperation with industries and the state and local health departments have not been completed. The process of blood testing is going ahead with routine examinations and time is required before all workers in the cooperating plants will be given tests.

For this reason, I am unable to present completed figures as to the incidence of syphilis among industrial workers. However, information is available in certain industries and seems to bear out the previous statements about the greatest incidence of syphilis being found in the lower income groups. An industry near Chicago has completed over 10,000 blood tests and found that 5 per cent of the workers had positive tests. A group of industries in Chicago has completed tests totaling more than 66,000, with 3 per cent positive. In Cincinnati 5,768 workers in various industries were given blood tests and 2.75 per cent were found positive. A single industry in Wisconsin employing skilled workers had 0.5 per cent (one half of 1 per cent) positive. Preliminary reports from a railway surgeon indicate that 4.7 per cent of a group of 10,000 railway workers have positive blood tests. An industrial physician in Milwaukee examining for many small industries found 4 per cent positive blood tests in 16,000 routine examinations. We expect in time to have the results of more of these case finding projects completed, and a more accurate picture of the incidence of syphilis in industrial workers will be available.

The importance of treatment in the prevention and spread of syphilis cannot be overestimated, it has such

Amount of Treatment in 6,807 Cases of Early Syphilis Before Lapse from Treatment or Discharge

Arsenical Injections with Interim Heavy Metal	Number	Per Cent
Less than 10 injections.....	4,077	59.9
From 10 to 19 injections.....	1,641	24.1
From 20 to 29 injections.....	749	11.0
From 30 to 39 injections.....	245	3.6
Injections numbering 40 or more.....	95	1.4
Total	6,807	100.0

Based on total cases of early syphilis treated by the five cooperating clinics (Ven. Dis. Inform. 15:341 [Nov.] 1934).

deep social and economic significance. Fortunately, treatment soon renders a patient noninfectious. The treatment of syphilis is necessarily long and expensive, and when a patient feels good it is difficult to have him return to the physician weekly for about a year and a half. Yet it is known that unless he completes treatment he will not be sure of escaping the late manifestations of the disease, such as heart and nervous system involvement. With the female patient there is the likelihood of pregnancies and the birth of syphilitic babies or abortions, and all this is in addition to the possibility of the same late manifestations as in the male.

Intensive programs of case holding coordinated with educational measures will tend to decrease the spread of infection and reduce the injurious consequences to the individual and the costs to society from general neglect of the disease. Case holding is vital to the public health and the program for the control of the disease in these early days immediately following infection.

The services of the follow-up nurses of the state and local health departments are available to private physicians in a number of places. When a patient lapses from treatment the physician can notify the health department, and the nurse will visit the patient and attempt to have him return to the physician for further treatment.

The nurse engaged in follow-up work of syphilis cases must impress on the patient that he has a danger-

ous disease. If this is done successfully, the continuation of treatment will be made easier. The mildness of the early stages of the disease and the lack of much pain associated with it make the problem of keeping the patient under treatment even greater. From the standpoint of treatment it is unfortunate that no more pain or annoying symptoms are associated with early syphilis. If such were the case, it would simplify the matter greatly. Extensive treatment over a period of many months is quite an undertaking and in many cases an expensive one. There may be need for certain adjustments in the life of the patient, and here is where the follow-up nurse is of great help. As a rule, the response made by the patient depends on the adequacy of the nurse in being able to instruct him about his disease.

Syphilis, as you know, is one of the few diseases for which there is a specific remedy. If treated early it can be cured and if treated later in its course it can be arrested. This sounds as if the cure of syphilis were a simple matter. It would be simple if every one knew the end results of the disease as well as most physicians, nurses and social workers. If syphilis were a more painful disease and there existed the necessity for relief from pain, it would simplify the problem of keeping patients under treatment until they were cured.

A study of 6,807 patients with early syphilis showed that 4,077, or 59.9 per cent, received less than ten treatments, 1,641, or 24.1 per cent, received less than twenty treatments and 749, or 11.0 per cent, less than thirty, and that 1.4 per cent received forty or more treatments (fig. 3).

The social and economic importance of treatment of syphilis is stressed in the following statements, which show the tragic results of neglect of treatment or of its inadequacy. Of a series of 590 patients with syphilis, 328 received inadequate treatment, 16.9 per cent of them contracted neurosyphilis and 3.4 per cent contracted cardiovascular syphilis. Of this group 191 received less than standard treatment; 10.5 per cent of them contracted neurosyphilis and 5.8 per cent contracted cardiovascular syphilis. Of the remaining sixty-one patients 1.6 per cent contracted neurosyphilis and none had cardiovascular involvement (figs. 4 and 5).

SUMMARY

Syphilis, like tuberculosis, presents a social and economic problem. Finding the early infectious cases and treating them prevent the spread of the disease. The finding and treatment of cases which have passed the infectious stage prevent the tragic manifestations of late syphilis.

There are over 15 million people in the mining, metal and manufacturing trades in the United States. A syphilis program which will include this group and members of their families would reach about half of the people of this country.

Industry, the workers, the health officer and practicing physicians must work together in syphilis program for industry, the first groups to find the cases and the physicians to give adequate treatment.

Education concerning venereal diseases should be a part of every health education program. Without education, we cannot conquer syphilis.

The elimination of syphilis from industrial workers will prolong their lives and make them better producers and a happier group of people.

BENZENE POISONING

REPORT OF CASE WITH STERNAL MARROW
STUDIES, AUTOHEMAGGLUTINATION
AND AUTOPSY

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IRVING GREENFIELD, M.D.

AND

MAX LEDERER, M.D.

BROOKLYN

Benzene (benzol, C_6H_6) is commonly used in industrial processes as a solvent, as a fuel, and in the manufacture of drugs and dyes. The recognition of benzene as an industrial hazard dates from the observation of Santesson¹ in 1897. This author reported a series of fatal cases of purpura in women employed in a bicycle factory in Uppsala, Sweden, where benzene was used as a solvent for rubber. After his clinical observations, Santesson produced chronic poisoning in rabbits both by injecting benzene subcutaneously and by wrapping the animals in cloth soaked with benzene. He found hemorrhages in the pleura, lungs and pericardium, and in the mucosa of the stomach and intestine. In 1900 he² succeeded in producing a marked degree of fatty degeneration of the organs of rabbits and concluded that benzene was the toxic agent.

At about this time in America Selling³ reported his observations on a group of three cases of purpura haemorrhagica occurring in young girls (14 years of age) who were exposed to benzene in the "coating room" of a tin can factory. Two of the three died. At autopsy the bone marrow from the femur of one showed very few cells. The predominant cells were normal red blood cells. The total number of leukocytes was greatly reduced, and on smear the majority were lymphocytes. The nuclei showed vacuolation, and the cytoplasm was thin, fragile and poorly stained. One megalokaryocyte was seen on careful examination of the cover slip. The bone marrow in the second case resembled closely that in the first, except that the reduction in the cellular elements had not reached quite so low a level.

Chronic poisoning results from the inhalation of benzene in industries in which it is used as a solvent and evaporates into the air of the workroom. Hemopoietic insufficiency, varying from mild anemia to complete aplasia which is incompatible with life, may result from such exposure.

We believe that the following case report of benzene poisoning is of interest because of observations on sternal marrow obtained by puncture ante mortem, the occurrence of autohemagglutination and the results of postmortem examination.

REPORT OF CASE

History.—J. K., a white man aged 43, admitted to the hospital March 30, 1938, had been employed as a pressman for twenty-five years. Until October 1937 he had worked only on black and white presses. Since that date he had worked on multicolored presses. In this line of duty he was exposed

to a variety of colored inks and inhaled fumes of benzene. The concentration of benzene vapors in the workroom air ranged from 50 to 740 parts per million parts of air. Approximately three and a half months after he had entered his new occupation he noticed a bluish blotch on his right thigh and had attacks of vomiting. He thought the black and blue mark was traumatic in origin and paid no attention to it. After several days the blotch disappeared. Following this, blue and red spots appeared on his left thigh and over his chest; bleeding from the nose occurred about four weeks before admission and recurred at frequent intervals. At about the same time he noted bleeding of the gums, weakness, loss of weight and loss of strength. Three weeks later he sustained a mild injury to the right arm and forearm. Large areas of discoloration appeared at the traumatic sites. Several days before he was admitted to the hospital he had bleeding from the rectum which lasted about two days. Three days prior to admission he complained of a sore throat, difficulty in swallowing and a swelling behind the right jaw. Aside from the occupational history noted, the past history was noncontributory.

Physical Examination.—The patient was well oriented and cooperative, in poor general physical condition and appearing acutely ill. The temperature was 104 F., the weight was 174 pounds (79 Kg.) and the blood pressure 126 systolic, 84 diastolic. The pulse rate was 124. There was a swelling about the size of an orange at the angle of the right mandible extending downward over the soft parts of the neck. The area was tender but did not present any evidences of infection. The patient had marked pallor, a foul breath from the mouth and extensive subcutaneous hemorrhages over practically the entire body. There was an extensive hemorrhagic area over the

TABLE 1.—Urinary Sulfate Values

Urinary Sulfate	4/2/38	4/7/38
Total sulfate.....	1.96 Gm.	3.32 Gm.
Inorganic sulfate.....	1.865 Gm.	3.22 Gm.
Percentage of inorganic sulfate.....	95%	97%

right half of both the hard and the soft palate. The right tonsil was covered by a necrotic exudate, and the peritonsillar area was markedly injected. The uvula was edematous and the gingival mucous membranes bled easily on manipulation. There was an extensive hematoma of the left buttock extending from the trochanter of the femur to the anus. This area was tender to touch and fluctuated. On rectal examination a large thrombotic hemorrhoid was noted at the posterior commissure. There were no ulcerations of the lower part of the rectal mucous membrane. The remainder of the physical examination gave essentially negative results.

Laboratory Data.—The blood Wassermann reaction was negative. The nonprotein nitrogen determination was 53.5 mg. in 100 cc. of blood, total protein 4.92 Gm. in 100 cc. of serum, albumin 2.8 Gm. in 100 cc. of serum, globulin 2.12 Gm. in 100 cc. of serum and blood plasma fibrinogen 0.591 Gm. in 100 cc. of plasma. The bleeding time was two and one-half minutes and the coagulation time three and one-half minutes. Repeated blood cultures were sterile. Urine studies on several occasions showed acid reaction, specific gravity ranging from 1.012 to 1.030, no sugar and some albumin (1 plus). On microscopic examination one noted occasional granular casts. There were no red blood cells visible. Repeated examinations for Bence Jones protein yielded negative results. A smear of the throat exudate showed no Vincent organisms. X-ray study of the skull and long bones failed to reveal evidence of any abnormalities of the bony structure. Urinary sulfate determinations are shown in table 1.

Bone Marrow and Peripheral Blood Studies.—Bone marrow aspiration was done on March 31 according to the technic of Morrison and Samwick⁴ as follows: The skin at the sternomanubrial junction was prepared with iodine and alcohol as for any surgical procedure. An 18 gage steel needle 2 inches

From the Department of Medicine and the Department of Pathology, Jewish Hospital.

1. Santesson, C. G.: Ueber chronische Vergiftungen mit Steinkohlen-theerbenzin: Vier Todesfalle, Arch. f. Hyg. 51: 336, 1897.

2. Santesson, C. G.: Beobachtungen über Benzolvergiftung besonders mit Rücksicht aus das Verhalten des Fettes im Organismus, Skandinav. Arch. f. Physiol. 10: 1, 1900.

3. Selling, L.: A Preliminary Report of Some Cases of Purpura Hemorrhagica Due to Benzol Poisoning, Bull. Johns Hopkins Hosp. 21: 33, 1910.

4. Morrison, Maurice, and Samwick, A. A.: A Simple Method of Bone Marrow Aspiration, J. Lab. & Clin. Med. 24: 858 (May) 1939.

in length, fitted with an obturator, was plunged through the skin at the midpoint of the sternum just below the sternomanubrial junction. A sudden give indicated that the bone marrow cavity had been entered. The obturator was removed from the needle and a 5 cc. syringe was attached. A minimal amount of bone marrow (from one to three drops) was drawn up into the syringe. The needle was removed and the contents

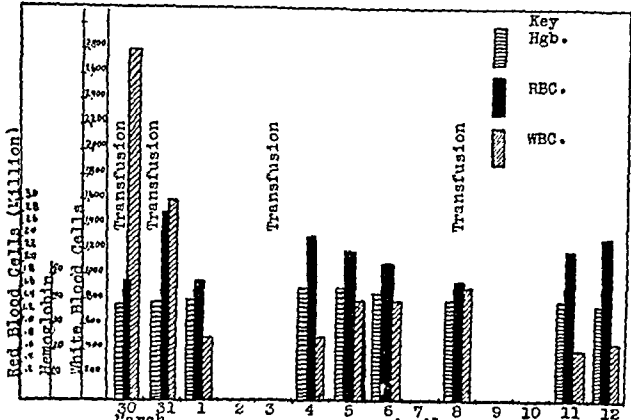


Fig. 1.—Blood counts.

of the syringe were ejected on clean slides. Thin smears were made. At the same time smears of peripheral blood were prepared. All were stained by the usual method, and the cells were studied. The results of the sternal marrow studies (reported by Dr. M. Morrison) are shown in table 2.

The lymphocytes were not degenerated. A smear of the peripheral blood was made at the same time. Only ten cells were counted; all were mature lymphocytes in good morphologic condition. No evidence of degeneration was noted. No polymorphonuclear leukocytes or other myeloid elements were seen. The platelets were diminished to zero. Slight anisocytosis, poikilocytosis and macrocytosis were present. In summary, the main features were (1) shift to the left of white blood cells (2 plus); (2) erythropoiesis diminished (evidence of aplasia); (3) erythropoietic series, maturation defect not

TABLE 2.—Composition of Sternal Marrow

Number of Cells	Bone Marrow Ratios
Myeloblasts..... 12	Granulocyte : lobocyte... 66:34
Myelocytes..... 38	Early : late erythroblast. 0:100
Eosinophilic myelocytes..... 2	Myeloid : smudge..... 58:42
Metamyelocytes..... 10	Myeloid : reticulum..... 55:45
Staff cells..... 4	Granulocytes : erythroid. 94:4
Polymorphonuclears..... 8	Myeloid : plasma..... 65:35
Eosinophils..... 26	Myeloid : lymphocyte..... 55:45
	Megakaryocyte, less than 2/1,000

discernible; (4) increase in plasma cells (3 plus); (5) degeneration of myeloid elements (3 plus).

Course in the Hospital.—The throat improved and the edema of the uvula and soft palate gradually subsided. The hemorrhagic area over the right side of the palate began to disappear. The ecchymotic areas on the arms, chest and buttocks became less pronounced. However, the patient still continued to complain of profound weakness.

On April 8, bleeding was noted from the gum margins and a large clot was removed from an ulcerated area over the right tonsillar fossa. A continuous slow, serosanguineous ooze from the base of the ulcer was noted. The possibility of erosion of a small vessel was considered, but because of the poor condition of the patient no attempts were made at ligation.

Direct transfusions of whole blood were given as follows: March 30, 300 cc.; March 31, 300 cc.; April 3, 350 cc., and April 8, 500 cc., as indicated in figure 1. In spite of these measures, the hemoglobin continued to fall. There were persistent severe anemia and leukopenia. Repeated blood smears showed a diminution in the granular elements of the blood.

The polymorphonuclear leukocytes fell as low as 3 per cent (table 3). The temperature ranged from 99 to 104 F. Bleeding from the gums continued. The patient's condition grew progressively worse, and he died on April 12, fourteen days after admission to the hospital.

Postmortem Observations.—Autopsy was performed on April 13, seventeen hours after death.

Gross Examination: The body was well developed and well nourished. There were purple ecchymotic areas over both

TABLE 3.—Blood Studies*

Date	White Cells	Poly-morpho-nuclears	Band Cells	Lymphocytes	Mono-cytes	Eosino-phils	Myelo-cytes	Myelo-blasts	Myeloid
3/31	1,600	11	..	83	5	1	..	..	..
4/1	500	14	..	85	1	..	..	..	..
4/4	500	16	..	82	2	..	..	..	..
4/5	800	26	..	74	..	..	..	..	..
4/6	800	6	2	82	6	..	..	..	..
4/8	900	18	18	62	2	..	..	..	..
4/11	400	8	..	90	2	..	..	..	..
4/12	530	3	..	85	..	..	3	1	1

* Note the paucity of the granular types of white blood cells. The figures represent the percentage after a total of 100 cells were counted.

antecubital regions, over the left side of the chest in the anterior axillary line between the third and fifth ribs, just above the right thenar region, on the anterior surfaces of both thighs and on the dorsal surfaces of both feet. The surface of the lower lateral half of the left leg was edematous, purple and indurated. The lymph nodes externally were not palpable. The conjunctivas and scleras were pale. The corneas were clear. The lips and buccal mucosa were pale blue.

The peritoneal cavity contained no free fluid, and its surface was smooth, glistening and pale. The edge of the liver pro-

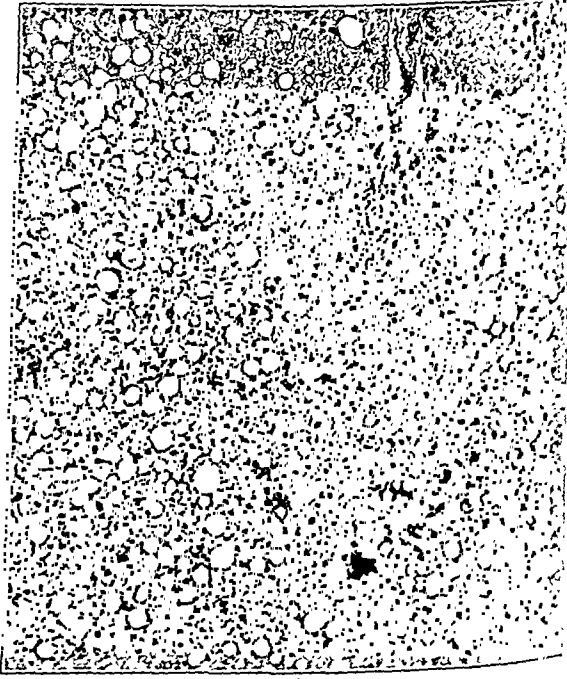


Fig. 2.—Liver, showing fatty changes; X 160.

truded 2 cm. below the xiphoid process. The pericardial cavity contained 60 cc. of clear yellow fluid. The tongue, the inferior portion of the pharynx and the larynx were normal. The thyroid weighed 40 Gm. The lymph nodes and blood vessels of the neck were not unusual.

The heart measured 12 cm. from apex to base. The endocardium was smooth and glistening. There was an abundance of subepicardial adipose tissue. The coronary arteries were normal. The myocardium was pale brown. The weight of the

heart was 430 Gm. The aorta was normal. There were a few small soft yellow plaques on the intimal surfaces.

The trachea was pale gray, smooth and glistening. The bronchial mucosa was injected. The right and left lungs weighed 520 and 470 Gm. respectively. The pleural surfaces were smooth and glistening. There were numerous petechiae on the visceral and parietal pleura.

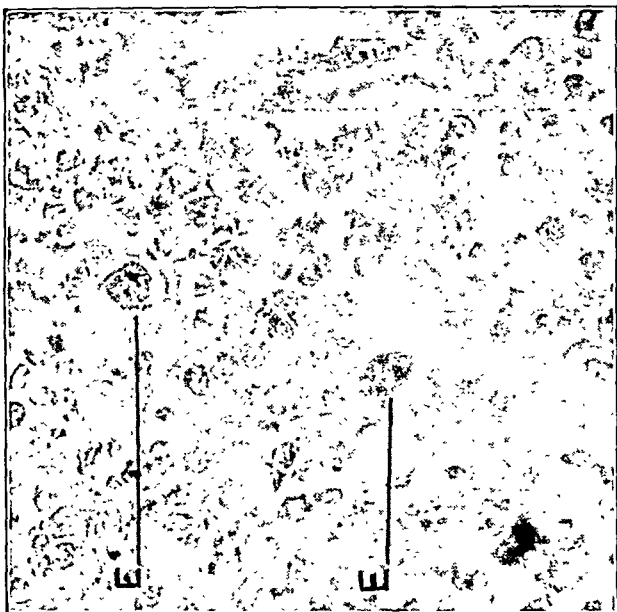


Fig. 3.—Spleen, showing pulpar hyperplasia. Note two large cells, erythroblasts, in the center; $\times 950$.

The tracheobronchial nodes were small.

The esophagus was smooth and pale gray. The stomach was dilated. The mucosa was thrown into high longitudinal folds and there were numerous petechiae in the pars media of the gastric mucosa. The mucosa of the distal half of the large intestine was dark gray-brown. There were numerous small varices in the rectum.

The liver measured 32 by 19 by 10 cm. and weighed 2,590 Gm. Its surface was smooth, glistening and pale brown. The cut surfaces were pale brown tinged with yellow. The lobular architecture was distinct. The consistency on section was increased. The gallbladder measured 4 by 3 by 1.5 cm. The serosal surface was yellow-gray and smooth. The wall was slightly thickened. The mucosal pattern was distinct. The pancreas weighed 95 Gm. The lobules were of normal size and appearance. The right and left suprarenal glands weighed 10 and 11 Gm. respectively.

Each kidney weighed 220 Gm. The capsules were thin and glistening. Occasional subcapsular petechiae were seen in both kidneys. The cortex was pale brown streaked with red. The pelves and ureters appeared normal. The mucosa of the urinary bladder was pale.

The spleen measured 14 by 8 by 4 cm. and weighed 180 Gm. The external surface was slightly wrinkled and gray-blue. The cut surfaces were dark red and brown; the malpighian corpuscles were distinct. The fibrous markings were delicate and the pulp could not be scraped off. The lymph nodes were small and the cut surfaces were red. The bone marrow was red and the trabeculae were not thickened. A section through the anterior portion of the left tibia was normal.

The brain weighed 1,520 Gm. The meninges were not unusual. The pia arachnoidal vessels were congested. The basilar artery and its branches showed an occasional small firm plaque. The gyri were somewhat flattened. The pituitary gland appeared normal.

Microscopic Examination: Thyroid Gland. The acini varied in size and contained deep pink fragmented colloid. They were lined by regular cuboidal cells. The poorly defined lobules

were separated by narrow septums of hyalinizing fibrous connective tissue. Between the acini there were numerous capillaries distended with blood.

Heart. In a section through the left ventricle the epicardium was not unusual. The subepicardial adipose tissue was abundant. The adventitia and media of the coronary arteries were thin; the internal elastica was broad and frayed. The intima was thick and composed of spindle shaped cells. The myocardial fibers and their nuclei were not unusual. In areas the myocardial fibers were separated by loose strands of connective tissue. Some of the smaller vessels were filled with collections of small round cells. The vessel walls were thin and appeared somewhat hyalinized.

Lungs. In a section through the left lung the pleura was of the usual width. The alveoli were irregular in size and shape. Some of the alveoli were broad, others were narrow. The interalveolar septums were delicate; many were incomplete or absent. Several of the alveoli contained an occasional mononuclear cell. The lumens of the bronchioles were empty.

Liver. The general architecture of the organ was somewhat abnormal, the normal arrangement of the lobules being disturbed. The cords were irregular in their outlines. The cells were swollen and varied considerably in size and shape. Those in the center of the lobules contained many small and a few very large vacuoles (fig. 2). The protoplasm was deeply eosinophilic and granular. The nuclei were mostly small and vesicular. The sinuses were narrow and for the most part empty. The Kupffer cells were distinct. In the periportal connective tissue a few small round cells were seen. No areas of hemopoiesis or bile pigment collections were seen.

Pancreas. The arrangement of the acini into lobules was orderly. The connective tissue septums were delicate. The islands of Langerhans were of fairly good size. The epithelium

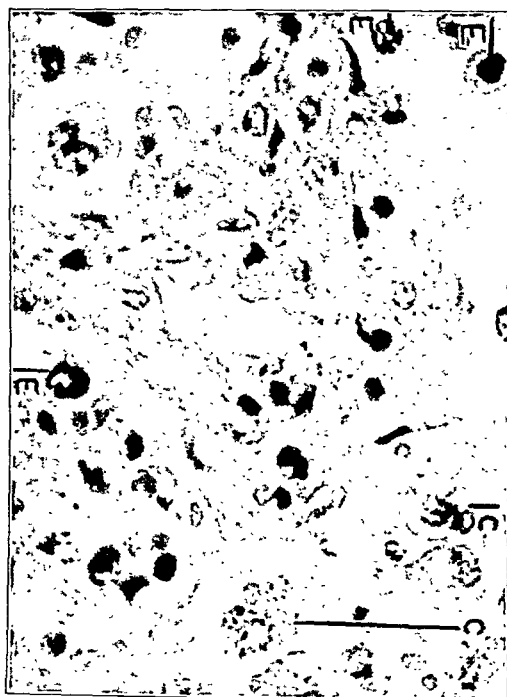


Fig. 4.—Mediastinal lymph node, showing erythrophagocytosis (C), pulpar hyperplasia and erythroblasts (E); $\times 950$.

of the ducts was well preserved. Within the lobules, many adipose tissue cells were seen.

Suprarenal Glands. The arrangement of the cell layers in the cortex was orderly. Many of the cells were vacuolated, shredded and foamy. The cortical cell groups were separated by narrow and wide spaces filled with red blood cells. In one area of the cortex the cells were displaced by a collection of red blood cells and rusty brown granular pigment. Most of the nuclei stained well. The medullary cells were fairly abun-

dant but distorted. The cytoplasm stained lavender and was granular. The borders were indistinct. The nuclei stained well. Several small areas of cortical cell layers were surrounded by delicate connective tissue capsules. In another preparation the medullary tissue was abundant.

Kidneys. The capsule was delicate. The glomeruli were of good size and distribution. The capillary loops were somewhat distended. The subcapsular space was of the usual width. Bowman's capsule was slightly thickened. The epithelium of the convoluted and collecting tubules was poorly preserved. The cell borders were indistinct; the cytoplasm was granular. The nuclei stained well. The lumens were of good size and contained granular material. The capillaries in the medulla were distended with blood. The pelvis in the sections from the left and the right kidney showed blood and loose epithelial cells. In a section from the left kidney there was a mass of blue-staining amorphous material which filled the distended lumen of one of the collecting tubules. The walls of the arteries disclosed a slight subintimal thickening. One of the smaller blood vessels was filled with pink stained amorphous material and a few irregular dark blue stained cells.

Prostate Gland. The acini varied in size. They were lined by well preserved cylindric and cuboidal cells with frequent infoldings. They were separated from one another by a dense fibromuscular stroma. The lumens contained pink amorphous material and many corpora amylacea.

Spleen. The architecture of the organ was well maintained. Only a few lymph follicles could be identified and these were very small. They consisted of the follicular artery surrounded by a few small round cells and an occasional large round cell. No germinal centers were recognizable. The site of former lymph follicles could be identified by the remaining central artery and some round cells. Scattered throughout the margins of the lymph follicles and the surrounding pulp were small collections of mononuclear cells, with reticulated nuclei and abundant dark staining protoplasm, which closely resembled

Lymph Nodes. Lymph nodes from the mediastinum and abdomen showed a normal architecture. The follicles showed no unusual features. In the pulp, many of the sinuses were greatly dilated, the walls were thin and were composed of a single layer of endothelial cells. The sinuses were occupied by many erythrocytes (fig. 4), a few mononuclear cells with scanty



Fig. 6.—Bone marrow from vertebra; marked hypoplasia; X 160.

cytoplasm and very few polymorphonuclear cells. Many very large mononuclears dominated the picture. These cells contained a clear protoplasm and a small, compact, deeply blue staining nucleus. Some were polygonal while others were round. Most contained from one to several red cells in various stages of degeneration. In others the protoplasm stained a diffuse pink, resembling the color of hemoglobin. Some contained many rust colored irregularly shaped pigment granules. No evidence of hemopoiesis was found.

Bone Marrow. Sections of the marrow from the vertebra, tibia and rib showed similar pictures. The bony construction was not unusual. The medullary tissue consisted almost exclusively of adipose tissue cells with a delicate connective tissue framework supporting a few blood vessels and capillaries. Sparsely scattered throughout were occasional immature cells, either singly or in clusters of a few. Only one fairly large island of hemopoiesis was found in a section of one of the vertebrae, 3.5 by 2 cm. in size (fig. 5). Detailed study of the cells showed them to consist chiefly of erythroblasts, with only a few young myeloid cells. Only rarely was a small megakaryocyte encountered. The capillaries were prominent and distended with erythrocytes. No areas of fibrous tissue replacement were seen. The marrow retained its structure except that it consisted of a meshlike screen from which all of the blood cells, with the exception of a few, had been removed. In other words, it presented a picture of almost complete aplasia (fig. 6).

COMMENT

Mode of Entry.—The extensive use of benzene in industry centers about certain very important properties of the product; first its solvent action, second its fuel action, and third its use as a starting point in the manufacture of dyes and drugs. Chronic benzene fumes in concentrations too low to produce marked narcotic effects are much more likely to be overlooked than is acute poisoning. Industrial poisoning is practically always produced by the inhalation of benzene fumes. Experimental poisoning has resulted from absorption through the skin and by the ingestion and subcutaneous



Fig. 5.—Bone marrow from vertebra, showing the only area found with some evidence of activity; X 160.

erythroblasts (fig. 3). Some had cytoplasm which stained pink. A few large cells with deeply staining pink protoplasm and from two to four, or occasionally more, deep blue staining nuclei were found. These areas are very suggestive of islands of hemopoiesis. In the dense pulpar areas the sinus walls were thick and made up of spindle cells, with pale staining protoplasm and oval vesicular nuclei. The capsule, trabeculae and blood vessels showed no unusual changes.

injection of liquid benzene,⁵ but the action of benzene is the same regardless of the mode of entry.

Blood Studies.—After his clinical observations, Selling³ injected into rabbits suitable doses of benzene in olive oil. Several days after the injections were given the white blood cells began to diminish in number, and in one animal a count of 20 cells per cubic millimeter was obtained. In the early stages of intoxication, large numbers of abnormal cells were seen on smear. Myelocytes were found in the blood of one rabbit. When the leukopenia reached the low grade just mentioned, death occurred in spite of the fact that the injections were stopped.

In later experiments on rabbits, Selling⁶ demonstrated a direct destruction of the leukocytes with reduced formation of new elements, destruction of the red blood cells and the prevention of the formation of new ones. Alice Hamilton⁷ noted that Selling's valuable contributions have been checked and confirmed many times by research workers as a preliminary to problems which required further study. Greenburg⁸ emphasized the fact that the change in the white blood count was by far the most important early sign of benzene poisoning. A destructive action on the blood platelets and on the megakaryocytes of the bone marrow was noted by Duke.⁹ The adult forms of the polymorphonuclear leukocytes disappear and, since young forms are not produced, their numbers diminish greatly.

The significant features of the blood in our case were the following: The white blood cell count was 2,800 on admission. A smear of the peripheral blood taken at the same time showed 14 per cent polymorphonuclear leukocytes and 78 per cent lymphocytes. In spite of the fact that a direct transfusion of 300 cc. of whole blood was given within a few hours after hospital admission, the total white cell count dropped to 1,600 within twenty-four hours and to 500 within forty-eight hours. The white cell count never rose above 900 during the remaining twelve days of the patient's life. Frequent studies of stained smears of the peripheral blood revealed a diminution of the granular types of the white blood cells with a marked increase in the lymphocytes.

Held and Lieberman¹⁰ have stressed the fact that benzene poisoning must be considered in the differential diagnosis of any case presenting an obscure anemia. They noted that the degree of the anemia may vary with the individual susceptibility and dosage. A study of figure 1 shows that the hemoglobin content on admission was 38 per cent (Sahli) and the red cell count taken at the same time was 1,740,000. After the first blood transfusion there was an insignificant elevation of both the hemoglobin and the red cell count. The hemoglobin reached 45 per cent on the sixth hospital day after the third transfusion had been given. Thereafter it dropped steadily in spite of transfusions. The red cell count was never elevated above 2,450,000.

In reviewing the literature, one notes that the red cell count in experimental animals with benzene poison-

ing does not parallel the red cell count in human beings with benzene poisoning. In the former, red cell counts were often normal, whereas in the latter varying degrees of anemia were the rule. Selling and Osgood¹¹ stressed the element of time in offering an explanation for this paradoxical observation. They noted that the experiment in animals lasted about two weeks and then the animals died or were killed. Within this short time the benzene had not affected the total red blood cell count. In human beings, however, the period of exposure varied from several weeks to years, depending on the individual susceptibility and the concentration of the benzene.

Urinary Sulfate Studies.—Urinary sulfate studies were made on two occasions. The first was done on a specimen of urine obtained the second day after the patient's admission to the hospital, or four days after his occupational exposure ceased. This study indicated that 95 per cent of the total sulfates were excreted as inorganic sulfates. A second study was done five days later. The result indicated that 97 per cent of the total sulfates excreted were in the form of the inorganic sulfate.

In their experiments on dogs, Yant and his co-workers¹² showed that the absorption of small amounts of benzene caused an increased proportion of the total sulfates of the urine to appear as organic salts. These workers felt that the absorbed benzene was oxidized in the body to phenol products. The phenol products were in turn conjugated with the sulfates by the liver and eliminated through the kidneys as conjugated sulfates. In order to determine the rate of excretion of inorganic sulfates in normal unexposed adults, Kammer and his co-workers¹³ studied the urinary sulfate excretion of 106 normal (nonexposed) males. They demonstrated that over 80 per cent of the total sulfate was excreted as inorganic sulfate in 90 per cent of this group. From their studies these workers concluded that when the inorganic fraction of the total urinary sulfates of persons exposed to benzene fumes dropped below the experimentally established normal of 80 per cent there could be no doubt that benzene was being absorbed and excreted.

Our studies indicate that the toxic agent (benzene) was no longer present in an active state when the urinary sulfate studies were done. Examination of the blood chart (fig. 1), however, reveals that the rise in the urinary inorganic sulfate excretion occurred at a time when the hemoglobin and red blood cell count continued to fall in spite of repeated transfusions. The white blood cell count at that same time was 900. From a prognostic point of view, in our case, repeated blood studies were of greater value than repeated urinary sulfate determinations. Harrington¹⁴ and Hunter and Hanflig,¹⁵ after a careful review of the cases reported, stated that when the white blood cell count fell below 1,000 the prognosis was very grave. Those patients who died with a white blood cell count of over 1,000 showed evidence of some complication at postmortem examination.

5. Final Report of the Committee on Benzol, National Bureau of Casualty & Surety Underwriters, May 1928.

6. Selling, L.: Benzol als Leukotoxin, Beitr. z. path. Anat. u. z. allg. Path. 51: 516, 1911.

7. Hamilton, Alice: Industrial Toxicology, New York, Harper & Brothers, 1934.

8. Greenburg, Leonard: Benzol Poisoning, Pub. Health Rep. 41: 1516 (July) 1926.

9. Duke, W. W.: Causes of Variation in the Platelet Count, Arch. Int. Med. 11: 100 (Jan.) 1913.

10. Held, I. W., and Lieberman, Abraham: Blood Dyscrasias Caused by Occupation, New York State J. Med. 38: 186 (Feb. 1) 1938.

11. Selling, Laurence, and Osgood, E. E.: Chronic Benzol Poisoning, Internat. Clin. 3: 52 (Sept.) 1935.

12. Yant, W. P.; Schrenk, H. H.; Hornath, A. A., and Reinhart, W. H.: Urine Sulfate Determinations as a Measure of Benzol Exposure, J. Indust. Hyg. & Toxicol. 18: 69 (Jan.) 1936.

13. Kammer, A. G.; Isenberg, Nathan, and Berg, M. E.: Medical Supervision of Benzene Plant Workers, J. A. M. A. 111: 1452 (Oct. 15) 1938.

14. Harrington, T. F.: Industrial Benzol Poisoning in Massachusetts, Boston M. & S. J. 177: 203 (Aug. 16) 1917.

15. Hunter, F. T., and Hanflig, S. S.: Chronic Benzol Poisoning, Boston M. & S. J. 197: 292 (Aug. 25) 1927.

Gall¹⁶ performed a sternal biopsy on a 45 year old man whose occupation required his exposure to benzene, ethyl acetate and butanol for about four years. Fixed sections showed replacement of the marrow by loose fibrillar tissue. Markedly diminished numbers of blood elements were noted in the stroma. Immature forms of granulocytes arranged in sparsely cellular groups were seen. Of the mature leukocytes, eosinophils predominated. Normoblasts, erythroblasts and megakaryocytes were present in moderate numbers. Megakaryocytes were absent.

Autohemagglutination.—In performing the grouping and cross matching preliminary to the fourth transfusion, a difficulty was encountered. The patient's cells were agglutinated by both testing serums, although on three previous occasions the patient had been found to belong to group O. Moreover, the patient's serum agglutinated the cells of a potential donor of group O. On further study the difficulty was found to be due to an auto-agglutinin. The patient's serum also agglutinated his own cells. The effect of this auto-agglutinin was eliminated by heating the serum and cells to body temperature, and the patient's blood group was confirmed to be group O. Accordingly, 500 cc. of blood was given by the direct Pennel method with no immediate or delayed reaction.

Autohemagglutination is a clumping of erythrocytes into irregular masses, visible to the naked eye, occurring in the presence of the individual's own serum, without bacterial action, at room temperature and reversible at body temperature. After carefully reviewing the literature, Boxwell and Bigger¹⁷ were able to find about twenty-two cases which they believed with certainty were true cases of autohemagglutination. Greenwald¹⁸ added his case of acute hemolytic anemia to this group of cases and noted that this phenomenon may occur in pernicious anemia, acholuric jaundice, multiple myelomas with hyperproteinemia, paroxysmal hemoglobinuria, severe pneumonias and staphylococcal septicemia. As far as we know, autohemagglutination has never been reported in a case of benzene poisoning. In autohemagglutination there is a definite interaction of the agglutinin of serum with the agglutinin of the red blood cell. This union can occur only at a temperature below that of the body. The effect of the auto-agglutinin in our case was eliminated by heating the patient's serum and cells to body temperature.

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16. Gall, E. A.: Benzene Poisoning with Bizarre Extramedullary Hematopoiesis, *Arch. Path.* 25: 315 (March) 1938.

17. Boxwell, W., and Bigger, J. W.: Autohaemagglutination, *J. Path. & Bact.* 34: 407 (July) 1931.

18. Greenwald, H. M.: Acute Hemolytic Anemia, *Am. J. M. Sc.* 196: 2 (Aug.) 1938.

Care of Feet During Pregnancy.—Normal pregnancy predisposes to disorders of the foot, first, because there is an increase in the weight load on them, and second, because there is frequently weakness of the structures. The enlarged abdomen forces the pregnant woman to walk with her feet everted, and the external rotation is conducive to foot strain and pes valgoplanus. During pregnancy a normal increase in weight is of course expected. This means that greater demands are made on the working ability of the foot. Furthermore, the functional capacity of the foot is decreased to some extent because of limitation of normal activity. For these reasons the orthopedist is in complete agreement with the obstetrician who guards his patients against abnormal increases in weight during pregnancy and recommends that the pregnant woman carry out normal activity as long as possible.—Hauser, Emil D. W.: *Diseases of the Foot*, Philadelphia, W. B. Saunders Company, 1939.

THE USE OF PROCAINE HYDROCHLORIDE AS A THERAPEUTIC AGENT

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Procaine hydrochloride (introduced as novocain) the successor to cocaine, has long enjoyed a vogue as a local anesthetic, and its value is well recognized. Recently its therapeutic value has been realized and many articles have appeared, especially in the foreign literature, attesting its efficiency and emphasizing its clinical potentialities. Our principal interest is in its therapeutic application, especially with regard to traumatic and orthopedic conditions, but after somewhat sketchily reviewing the literature we feel that it might be worth while to call attention to its application in other branches of medicine and surgery.

Procaine hydrochloride is the hydrochloride of para-aminobenzoyl-diethylaminoethanol. The dosage is from one to three times that of cocaine, and its anesthetic and irritant actions are perhaps slightly less. The drug on direct application acts by paralyzing the sensory nerve fibrils without preceding stimulation, but in higher concentrations it will paralyze all other nerve fibers and indeed all protoplasm. It also causes local vasoconstriction.

The number of different conditions in which it is employed is great. Its therapeutic use is advocated in various syndromes in internal medicine, in urology, in eye, ear, nose and throat work, in dental surgery, in general surgery, in obstetrics and even in psychiatry.

Turning to internal medicine, one finds articles advocating procaine hydrochloride in angina pectoris, bronchial asthma, apoplectic shock, intermittent claudication, arteriosclerosis, herpes zoster and other conditions, while in general surgery it has been reported of value in ileus, phantom limb pain,¹ cutaneous cicatrices² and certain infectious and inflammatory processes. In urology it has been recommended in acute epididymitis and in many of the complications of gonorrhea. One article advocated its use in puerperal phlebitis. However, it is its use in traumatic and orthopedic conditions in which we are chiefly interested, and it is in this field that we have quite extensively employed procaine hydrochloride therapeutically in this clinic during the past year.

MECHANISM

Procaine hydrochloride is of value in these conditions, according to Leriche, because it suppresses by means of its local anesthetic action the nerve irritation inaugurated by trauma. There exists a rich nerve supply in the supportive tissues of the human skeleton, especially in the ligaments in the region of an articulation. Following trauma, a violent excitation of this supply occurs with a disturbed vasomotor functional state characterized clinically by muscle spasm, loss of motion, pain and tenderness. By eliminating the pain impulses that emanate in automatic waves from the

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1. Livingston, W. K.: Phantom Limb Pain: A Report of Ten Cases in Which It Was Treated by Injections of Procaine Hydrochloride into the Thoracic Sympathetic Ganglions, *Arch. Surg.* 37: 551-573 (Sept.) 1938.

2. Leriche, René: Treatment of Pains Due to Cutaneous Cicatrices, *Progrès méd.*, Jan. 9, 1937, p. 49.

traumatized area it causes a return of the normal vasomotor tone and for the time being and often permanently normal regulatory impulses are set up.

In brief, following trauma there is a change in the normal vasomotor equilibrium with the development of hyperemia due to vasodilatation. Procaine therapy, by eliminating pain impulses and by virtue of the fact that it is a vasoconstrictor, causes a return to a normal vasomotor equilibrium.

FRACTURES

Procaine hydrochloride has been used in fracture work as an anesthetic agent for many years, but recently its therapeutic use has been advocated in specific types of fractures—mainly those in which severe ligamentous injury was primary and the fracture itself of secondary importance. Such injuries include fractures of the transverse processes, chip fractures of the humeral epicondyles, undisplaced fractures of the head of the radius and fractures of the spinous processes of the vertebrae. We have employed procaine hydrochloride in all these conditions with gratifying results, both functionally and economically.

We have observed in our extensive use of local anesthesia in the treatment of fractures in general, and especially Colles fractures, that the patient's postreduction course was much more pain free and was accompanied by an earlier restoration of function as compared to the use of general anesthesia. We had been at a loss to account for this, as the anesthetic effect in itself wears off in a few hours, until we studied Leriche's articles in which he points out that anesthesia with procaine hydrochloride reestablishes the disturbed vasomotor equilibrium by removing pain impulses.

Briefly, a few instances will be cited in which procaine hydrochloride was used therapeutically in the treatment of fractures, sometimes accompanied by physical therapy.

CASE 1.—A man aged 68 who was in an automobile accident twenty-four hours previous to examination complained of a painful, stiff neck. Examination revealed generalized tenderness from the third to the sixth cervical vertebra with widespread cervical muscle spasm. The head was tilted to the right. X-ray examination revealed fractures of the third, fourth and fifth cervical spinous processes. He received an injection of 2 per cent procaine hydrochloride with immediate relief of pain and prompt disappearance of spasm and tenderness. The tenderness and pain later recurred to a mild extent but finally disappeared almost completely after a second injection three weeks from the date of the injury.

We were interested after treating this patient to read an article by Fritz Schne³ in which he recommended treating avulsion fractures of the spinous processes with procaine hydrochloride. Fractures of the spinous processes are difficult, almost impossible, to reduce, let alone to retain in the reduced position until bony union is complete. Experience shows that bony union seldom occurs, the majority healing with pseudarthrosis. The latter causes no trouble worth mentioning. Hence, when procaine therapy is used pain is allayed and the patient is convinced of the harmlessness of his injury, since all movements are possible as soon as the anesthetic takes effect.

CASE 2.—A man aged 27 sustained direct injury to the left elbow twenty-four hours before examination. Clinical and x-ray examinations revealed a small fracture of the head of

the radius with no displacement of the fragments. The patient received one injection of procaine hydrochloride with almost complete relief of pain and with a good return to rotation of the forearm, although following injection there was some limitation of complete extension. He was followed closely and fourteen days after his injury had no soreness about the elbow, normal rotation and about 5 degrees of flexion deformity. He was given physical therapy from the outset and kept at his work, which consisted of moderately heavy manual labor.

Several fractures of the transverse processes of the lumbar spine have been treated by this method.

CASE 3.—A high school football player with fractures of the second and third right lumbar transverse processes received one injection with complete relief of pain and spasm and return of full motion. This patient several days later participated for several minutes in a football game, against our advice, in order to earn his letter.

It is with fractures of the transverse processes that we feel that procaine therapy is especially valuable, for any other treatment such as braces, corsets, plaster of paris casts or open operation may unwillingly foster neurotic fixations and lead to prolonged disability.

We realize that the recommendation of procainization and activation in fractures of the lumbar transverse processes is at variance with the accepted methods now generally employed. However, in such injuries the essential pathologic process is the associated ligamentous tear, the fracture itself being of secondary importance. Since the ligamentous origin of the psoas major, the quadratus lumborum and the sacrospinalis muscles is extensive, there is little likelihood of further trauma being inflicted by active use of the muscle group after procaine hydrochloride has been used to abolish the pain impulses.

Reduction of these fractures of the transverse processes is difficult to achieve, and the aim of the accepted treatment by casts, braces or bed rest is essentially for the relief of pain. Procaine hydrochloride, in eliminating the pain impulses, permits active mobilization and does away with the undesirable sequels seen with immobilization such as atrophy, stiffness and the neurotic fixations that are especially common in fractures of the transverse processes.

A fracture of the lateral epicondyle of the humerus was treated by injection of procaine hydrochloride several months ago in a patient admitted with multiple fractures of the lower extremities. One injection was all that was required to permit complete return of function to the affected elbow, with permanent subsidence of pain and muscle spasm and with full immediate return of motion.

Leriche and Froehlich⁴ in 1936 published an account of their results of treating certain articular fractures with procaine hydrochloride infiltration and immediate active mobilization. In articular fractures without displacement, or with a displacement not requiring an exact reduction, these authors infiltrated the surrounding ligaments as though there was a sprain as well as the focus of the fracture itself in such a fashion as to block the vasomotor phenomena which create secondary arthritis, thus permitting by suppression of the pain an immediate active mobilization.

Leriche presented three cases in detail in which he had employed procaine therapy and concluded that the

3. Schne³, Fritz G.: Treatment of Avulsion Fractures of Spinous Processes, *Wien. klin. Wchnschr.* 50: 191-193 (Feb. 12) 1937.

4. Leriche, René, and Froehlich, F.: Treatment of Certain Articular Fractures by Procaine Hydrochloride Infiltration and Immediate Active Motion, *Presse méd.* 44: 1665-1666 (Oct. 24) 1936.

method has a wide margin of application in all cases in which there is no absolute necessity for reduction and maintenance of the reduction by apparatus. He writes that it is astounding to see how the immediate restoration of function and the suppression of pain, signs of a post-traumatic vasomotor imbalance, improve the quality of the result and notes that simple surgical good sense is sufficient to indicate the limits of this new manner of obtaining immediate mobilization in fractures. Our observations coincide with his and we have been equally impressed by the results of treatment.

SPRAINS

Procaine hydrochloride also has a wide use in the treatment of sprains. The mechanism again is similar to that mentioned earlier and consists of suppressing the nerve irritation by means of local anesthesia of the ligament.

There are three groups of sprains in which this drug may prove of great value: The first group includes sprains unaccompanied by fractures or ligamentous tears. The former are ruled out by x-ray examination and the latter by absence of abnormal articular laxity. In this group one or two injections may be sufficient to permit normal, painless function of the joint. In the second group, those characterized by pain and muscle atrophy—the after-effects of sprains—procaine hydrochloride is often of great benefit. The third group consists of "operation sprains"—those characterized by pain, tenderness and some interference with function following operations on joints.

In those instances in which a tear of a ligament is present, the injection of procaine hydrochloride into the ligament proves itself a diagnostic aid and indicates the need of immobilization as the treatment of choice.

Although sprains may be treated at all stages by injections of procaine hydrochloride, the most prompt and constant results are obtained in those cases in which the injections are performed in the first twenty-four hours.

CASE 4.—A truck driver aged 25 was in an automobile accident the day before he was examined, having been pinned beneath a truck. Weakness in the right upper extremity developed, with much pain in the right shoulder. Examination revealed a very tender area over the acromioclavicular joint with severe pain localized at this joint on motion of the shoulder joint. The x-ray examinations gave negative results. A diagnosis of acromioclavicular ligamentous sprain was made and 2 per cent procaine hydrochloride was injected with considerable immediate relief. When he was seen forty-eight hours later there was excellent motion and no pain on motion. He was advised to return to work.

CASE 5.—A man aged 30, a laborer, was placing a piston in an engine by pushing with his feet and bracing with his back. Suddenly he felt his back "give way" and experienced severe pain in the small of the back. He was examined twenty-four hours after the accident and typical signs of sacro-iliac sprain were found on the right side. It was decided to treat this patient conservatively, and accordingly he was placed in traction. For three weeks there was very little change in the physical appearance; the tenderness, limitation of motion and muscle spasm were almost as marked as on admission. At the end of the third week procainization was inaugurated, two injections being employed at intervals of four days. The results were most striking, especially when compared to the slow progress made under the accepted conservative method of treatment. The patient, after the first injection, became ambulatory and received a second injection only because of a moderate recurrence of symptoms. He has since had no pain.

MUSCLE CONTUSIONS

In addition to fractures and sprains, a third traumatic entity in which excellent results have been obtained is that group labeled muscle contusions or muscle sprains. The mechanism once again consists in restoring a normal vasomotor equilibrium. We have treated among others contusions of the trapezius, deltoid and rhomboid muscles and contusions of the common extensor group of the forearm. One or two examples may suffice:

CASE 6.—A high school basketball player was kicked on the right side of the neck with resulting swelling, tenseness and tenderness of the belly of the right trapezius muscle. The injury was a particularly disabling one requiring admission to the hospital. After three injections of procaine hydrochloride there was no longer any tenderness or spasm and very little limitation of motion. When seen several weeks after his discharge from the hospital, he had no symptoms or signs pertaining to the trauma.

CASE 7.—A young man was struck across the extensor surface of the right forearm just below the elbow by a falling log. He had immediate complete disability, with exquisite pain, tenderness, loss of function and marked spasm. Although a fracture was suspected, the x-ray films were negative and following one injection of 2 per cent procaine hydrochloride into the proximal dorsal surface of the forearm there was complete subsidence of the signs present before injection. When seen one week later there were no residua of the trauma.

TRAUMATIC SYNOVITIS

The treatment of acute traumatic synovitis by procaine hydrochloride has been followed with striking improvement in those instances in which it has been employed. We call to mind in particular two cases of acute traumatic synovitis in which injection of the drug into the joint along with aspiration of the syrupy, bloody fluid was accompanied with complete relief of pain, permanent in these two cases, and with a rapid, early restoration of complete articular function.

BURSAE

In the various inflammations of bursae, often associated with calcification of the bursa or an adjoining tendon, procaine therapy has in our series of cases proved an excellent method of obtaining an early, often permanent, cure. Cases of acute subdeltoid bursitis and subacute subdeltoid bursitis associated with calcification have all been treated by this method.

CASE 8.—A woman aged 66 seen in the clinic complained of severe pain in the right shoulder of three days' duration. Previous to the onset of the acute pain she had had dull pain for weeks, being unable to use the shoulder. She was unable to sleep at night because of the intensity of the pain. Examination revealed a point of exquisite tenderness over the greater tuberosity with external rotation and abduction limited and painful. X-ray examinations were negative. The impression was that it was acute subacromial bursitis and the treatment consisted of one injection of 2 per cent procaine hydrochloride at the site of maximum tenderness. The patient obtained almost complete relief. When seen one week later, she stated that she was having only slight occasional pain and was sleeping well. There was no tenderness, and motion was of full range. Her symptoms have not recurred.

Injection of procaine hydrochloride has been carried out in seven cases of calcification of the supraspinatus tendon with marked prompt relief in the majority of cases, although it must be pointed out that needling the calcium deposits, thus relieving the tension, may in itself be sufficient to ease the pain. Two patients with

peritrochanteric bursitis with calcification have also been treated in this manner with a prompt disappearance of symptoms.

It has already been stated that in traumatic syndromes procaine hydrochloride, by abolishing the hyperemia due to vasodilatation, causes vasoconstriction and thus, in temporarily abolishing the pain impulses from a part, permits the restoration of a normal vasomotor tone. However, there are some conditions, the arthritides and the neuralgias among others, in which the pain is due to hypoxemia induced by spasm of the vasa vasorum and the vasa nervorum. In these instances the result of procainization is a matter of vascular dilatation and lasting hyperemia, but here, as in traumatic conditions, the underlying physiologic process is a restoration of the vasomotor tone to its normal state.

ARTHRITIS

In the field of arthritis, procaine therapy has been employed by many men.⁵ Fenz and Falta⁶ have in osteo-arthritis infiltrated the musculature and ligaments about affected joints with encouraging results. In hip disease the region of the adductors or of the gluteal musculature is injected. In traumatic arthritis the drug may be of value prophylactically and actively. If, as Leriche⁷ indicates, the post-traumatic arthritides follow minor articular trauma, the use of procaine hydrochloride in these conditions, namely sprains and contusions, must surely serve as a preventive for the later development of traumatic arthritis. If osteo-arthritis already exists, especially if aggravated by trauma, procaine therapy often proves of definite value, although in this category the responses are not so dramatic as in the acute traumatic conditions.

CASE 9.—A man aged 51, recently seen in the clinic, complained of severe pain in the right shoulder and limitation of motion of the right shoulder joint. He had had direct injury to the shoulder several days before admission, and examination revealed exquisite tenderness over the acromioclavicular joint with severe pain on motion of the upper extremity. X-ray examination revealed osteo-arthritic changes of the acromioclavicular joint and no evidence of fracture. He received several injections of procaine hydrochloride. Following each injection there was almost complete relief of pain and marked return of function, but after several days the pain and loss of motion would return. However, after several injections the severe pain gradually subsided and the range of motion increased much more rapidly, we feel, than it ordinarily does in similar cases in which physical therapy, rest or splinting is instituted.

SCIATICA

Many authors recommend procainization in sciatica.⁸ Various technics of injection have been outlined, some of which consist of injecting the fluid directly into the nerve trunk while others are concerned with epidural deposits. Fenz⁹ proved beyond doubt that the effect, which was instant and sometimes lasting, was due to the procaine hydrochloride and not to the large amount of fluid deposited by showing that the same amount of physiologic solution of sodium chloride, without procaine hydrochloride, had no effect whatever.

5. Tassy, J. M., and Steinbrocker, Otto: Supraclavicular Brachial Plexus Block: An Accessory Therapeutic Measure in Arthritis of the Shoulder Joint and Allied Conditions, *New York State J. Med.* 37:1275-1278 (July 15) 1937.

6. Falta, W., and Fenz, E.: The Therapeutic Value of Novocain Infiltration in Internal Medicine, *Wien. klin. Wchnschr.* 51:578 (May 27) 1938.

7. Leriche, René: The Problem of Osteo-Articular Diseases of Vasomotor Origin, *J. Bone & Joint Surg.* 10:492-500 (July) 1928.

8. Corneliu Sărbătorescu, of Jassy, Rumania, cited in *Treatment of Sciatica with Local Anesthesia*, Bucharest letter, *J. A. M. A.* 107:144 (July 11) 1936.

9. Fenz, W.: Presacral Procaine Hydrochloride Injections in Sciatica, Vienna letter, *J. A. M. A.* 108:15:1275 (April 10) 1937.

While the underlying etiologic factors that give rise to the sciatic syndrome are increasing in number each year—the most recent important contribution being concerned with the role of the ruptured nuclear disk—there is still a sufficient number of patients with idiopathic sciatica to warrant the use of procaine therapy in such cases for the relief of symptoms.

Among the other conditions in which procaine therapy seems to have been of value may be mentioned tennis elbow and painful xiphoid processes. In the latter, a series of injections may be required before lasting relief is obtained.

TECHNIC

The technic of procaine injection is comparatively simple: 1. From 10 to 30 cc. of 1 or 2 per cent solution of procaine hydrochloride is injected at the site of maximum tenderness. Needless to state, absolutely sterile precautions must be observed. The needles and syringe are those used ordinarily for local anesthesia.

2. Before injection it is best to give the patient orally sodium amytal, usually from 1½ to 3 grains (0.1 to 0.2 Gm.). This is done to prevent procaine reactions, which are frequently observed but are usually of a harmless nature.

3. After the injection the patient is encouraged to employ immediate active motion. He is generally astonished to find painless motion possible.

4. Repeated infiltrations, at daily intervals if necessary, are carried out if a recurrence of symptoms develops.

5. The patient should be told two things: (a) He should be urged to employ immediate active motion; (b) he should be warned to expect increased pain several hours after injection. This is caused by an increase in the blood supply to the tissues infiltrated with procaine hydrochloride but usually disappears in a short time.

This therapeutic agent which we propose for use in a number of minor traumatic and orthopedic conditions has proved exceptionally efficacious in our hands.

SUMMARY

1. Procaine hydrochloride as a therapeutic agent is valuable in certain acute traumatic syndromes and has widespread use in many of the specialties.

2. The action of the drug is in restoring a normal vasomotor tone by eliminating the pain impulses. In acute traumatic conditions procaine hydrochloride overcomes the hyperemia due to vasodilatation, while in the arthritides and neuralgias the spasm of the vasa vasorum and the vasa nervorum, with a resulting hypoxemia, is abolished. In both instances procaine hydrochloride, by eliminating pain impulses, permits a restoration of a normal vasomotor equilibrium.

3. Procaine therapy is of definite value in fractures not requiring accurate reduction and immobilization. Such fractures include fracture of the lumbar transverse processes, fractures of the vertebral spines, fractures of the head of the radius and fractures of the epicondyle, among others.

4. Ligamentous sprains, muscle contusions or sprains, acute traumatic synovitis and acute bursal episodes are other conditions in which the drug has been used with striking results.

5. Procaine hydrochloride has given encouraging results in certain cases of arthritis and sciatica.

COMPARATIVE EFFECTS OF PHENOBARBITAL AND DILANTIN SODIUM

IN THE TREATMENT OF EPILEPSY

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This paper embodies observations on the comparative effects of phenobarbital and dilantin sodium in the treatment of epilepsy.

Material for this study comprised a group of 100 patients at the Monson State Hospital, who were elected on the basis of frequency and regularity of convulsive attacks regardless of diagnosis, age, sex, age of onset, duration of attacks, mental status, physical condition or previous medication. The vast majority of the patients had been having ten or more seizures per month regularly. Medication previous to this study had consisted of phenobarbital in doses of 3 grains (0.2 Gm.) or less daily.

The effect of treatment by phenobarbital or dilantin sodium was evaluated on the basis of effect on seizures, salutary effects, effects on the general condition of the patient, and untoward effects. The therapeutic response was graded as follows:

Group 1. Complete control of, or marked reduction in the number of seizures, with absence of untoward effects or only slight and easily managed untoward effects.

Group 2. Moderate reduction in the number of seizures with salutary effects or easily controlled untoward effects.

Group 3. No appreciable reduction in the number of seizures or increased number of seizures, with or without untoward effects; or marked untoward effects which could be managed only by terminating treatment and which overshadowed any anticonvulsant and/or salutary effects.

Group 4. Indeterminate, no definite favorable or unfavorable effects being noted during the period of observation.

Our study divided itself into the following three phases: (1) treatment with phenobarbital alone, (2) treatment with dilantin sodium alone and (3) treatment with a combination of phenobarbital and dilantin sodium.

PHENOBARBITAL IN EPILEPSY

The 100 patients, representing the total number of cases included in our complete study, were given phenobarbital in gradually increasing doses either until the maximal anticonvulsant effect was obtained or until untoward effects contraindicated further increases or demanded reduction in dosage. Thirty-seven of the 100 patients derived marked benefit from the larger

doses of phenobarbital alone and are classed as P 1 (P refers to phenobarbital and the numeral 1 to group 1 in the classification previously indicated). During the period of increased phenobarbital dosage, the maximal and optimal doses of phenobarbital ranged from $3\frac{1}{4}$ to $11\frac{1}{4}$ grains (0.2 to 0.7 Gm.) a day. Twenty-eight patients are taking 6 grains (0.4 Gm.) or more of phenobarbital a day and twelve are receiving 9 grains (0.6 Gm.) or more of phenobarbital a day. Twenty-seven of the thirty-seven patients have been on the larger doses of phenobarbital for from eleven to fifteen months and ten for from three to ten months. Only a few patients experienced untoward effects, which have been slight, transient and easily managed. Salutary effects have been common, consisting of increased activity, alertness, desire and willingness to work, and greater interest in surroundings.

DILANTIN SODIUM IN EPILEPSY

Fifty-six patients who were not greatly benefited by large doses of phenobarbital were given dilantin sodium in gradually increasing doses, ranging from 5 to $13\frac{1}{2}$ grains (0.2 to 0.9 Gm., or two to nine capsules). The criteria used for changing medication from phenobarbital to dilantin sodium were (1) complete failure of large doses of phenobarbital to lessen frequency of seizures, (2) only slight to moderate reduction in the number of seizures and (3) untoward effects associated with large doses of phenobarbital, which either prevented raising phenobarbital to the anticonvulsant level or which overshadowed any favorable anticonvulsant effects.

Forty-five of the fifty-six patients have been followed for from two to eight and one-half months while taking dilantin sodium and eleven for from three weeks to two months. The length of time these patients had been receiving the larger doses of phenobarbital varied from three weeks to six and one-half months.

Evaluation of the results obtained with this group of patients is summarized as follows:

Twelve, or 21.4 per cent, obtained excellent improvement on dilantin sodium with regard to both anticonvulsant and salutary effects (group 1). Of these twelve patients only two did equally well on phenobarbital.

Seventeen patients, or 30.3 per cent, showed moderate improvement on dilantin sodium (group 2). Of these seventeen patients, eleven did equally well on phenobarbital and six were definitely worse on phenobarbital.

Totaling the number of patients in groups 1 and 2, we find that twenty-nine, or 51.7 per cent, were much improved on dilantin sodium. This includes thirteen patients who did as well on phenobarbital.

Twenty-seven patients, or 48.2 per cent, did poorly on dilantin sodium (group 3). Of these twenty-seven patients, four did moderately well on phenobarbital and twenty-three did as poorly on phenobarbital.

Whatever results have been obtained with dilantin sodium have been obtained in a group of patients a but two of whom were selected on the basis of failure to respond satisfactorily to large doses of phenobarbital. The results with dilantin sodium impress us as especially significant because we are inclined to believe that any anticonvulsant drug is unlikely to show up to its best advantage in many institutional patients of this type.

There was no correlation between results with dilantin sodium and dosage, for some patients taking

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Abstract of paper presented at the joint meeting of the American Epilepsy Society, the International League Against Epilepsy and the Section on Convulsive Disorders of the American Psychiatric Association, Chicago, May 8, 1932.

While observations on the effects of larger doses of phenobarbital were being made, we learned of the use of dilantin sodium by Merritt and Putnam through personal communication and published data (Merritt, H., and Putnam, T. J.: Sodium Diphenyl Hydantoin in the Treatment of Convulsive Disorders, *J. A. M. A.* 111:1068-1073 [Sept. 17, 1932]). Part of the dilantin sodium in our study was furnished us through Dr. J. D. Ralston, of Parke, Davis & Co.

as little as $4\frac{1}{2}$ grains (0.3 Gm., or three capsules) of dilantin sodium did very well, while others receiving as much as $13\frac{1}{2}$ grains (nine capsules) did not do well. The optimal dose varied from 3 to $10\frac{1}{2}$ grains (0.2 to 0.7 Gm., or two to seven capsules). Likewise there was no correlation between the size of the dose of phenobarbital and the results obtained. The optimal dose of phenobarbital varied between 3 and 11 grains.

While, to be sure, most patients in this series experienced toxic effects from the larger doses of phenobarbital or from dilantin sodium at some time, it should be kept in mind that, in the very nature of this investigation, unless an appreciable anticonvulsant effect was produced by a nontoxic dose, it was necessary to increase medication steadily to the point of toxicity.

Lethargy, ataxia, anorexia, nystagmus and tremor were toxic effects common to phenobarbital and dilantin sodium; whereas epigastric distress, ocular pain, diplopia and hyperplasia of the gums were related solely to dilantin sodium. Benzedrine sulfate was found effective in controlling apathy and lethargy, and sodium bicarbonate in controlling nausea and vomiting. The other untoward effects were controlled by decreasing the dose of the drug. A distinct advantage of dilantin sodium is the lack of sedative effects except in toxic doses, which is in marked contrast to the effects of phenobarbital in the larger, therapeutic doses. None of our patients had dermatitis while on dilantin sodium, and no serious untoward effects were associated with dilantin sodium therapy.

From experience gained during the course of this study, we believe that untoward effects could often have been considerably lessened had we increased the doses of phenobarbital and dilantin sodium more slowly than was done and temporarily reduced the doses more often during periods of inactivity. During the first part of the period in which we used dilantin sodium we gave some patients as much as nine capsules a day ($13\frac{1}{2}$ grains), since we did not know what the limit of dosage should be. Untoward effects were common and almost invariable when more than six capsules (9 grains) a day were given. Now we have established six capsules as the maximum limit of dosage; and we hesitate in giving more than four capsules (6 grains) a day.

COMBINED PHENOBARBITAL AND DILANTIN SODIUM IN EPILEPSY

During the course of the second part of the study, designed to evaluate the comparative effects of phenobarbital and dilantin sodium, it was found that several patients received no appreciable beneficial anticonvulsant effects from either of these drugs. In some cases the patients were intolerant to relatively small doses of either drug, while in other cases large doses, although well tolerated, had little or no anticonvulsant effect. This situation prompted us to try a combination of well tolerated smaller doses of phenobarbital and dilantin sodium. Such medication was in some instances rewarded by remarkably gratifying results: Seizures were greatly reduced in number, untoward effects did not appear, and salutary effects sometimes accompanied the reduction or cessation of seizures.

Twenty patients are now on medication consisting of a combination of phenobarbital and dilantin sodium in small to moderate size doses. Six of the twenty patients have been on combined therapy for from four to six months, thirteen patients for from two to three months and one patient for one month. Combined

therapy for these twenty patients has in most instances been more beneficial than any previously used medication; and with eight patients the favorable response to combined therapy has been impressive.

COMMENT

With regard to the type of patients selected in this study, it should be kept in mind that all were institutional patients, all were selected on the basis of frequent seizures, many were of low grade type and deteriorated, and most of them had had seizures for many years. Thus, a certain number of our patients were perhaps of a type less likely to benefit by any therapeutic approach. As a rule, the patients who obtained greatest benefit, whether receiving the larger doses of phenobarbital alone, dilantin sodium alone or combined phenobarbital and dilantin sodium medication, were the younger and better preserved. However, exceptions were sufficiently numerous to encourage therapeutic efforts even in seemingly hopeless cases.

When dilantin sodium proved more efficacious than phenobarbital, the results were usually quite striking. Combined medication, resorted to after patients had had a fair trial with phenobarbital and dilantin sodium alone to compare the effects of these drugs separately, was found to be of decided advantage.

(In a group of patients who approach the noninstitutional type, being better preserved and having less frequent seizures—not included in the present report—we are finding that both dilantin sodium and combined medication are giving definitely better results on the whole.)

We believe that dilantin sodium is a most welcome contribution on three grounds: first, it is superior to phenobarbital in some cases in which phenobarbital can control seizures only to a limited extent or not at all; second, it is often a most effective adjunct used in combination with phenobarbital; and third, it has no sedative effect in therapeutic doses.

In closing this paper we would emphasize what is perhaps too often taken for granted, but sometimes neglected; namely, individualization of treatment. By this we mean periodic reevaluation and readjustment of medication in epilepsy, rather than application of a more or less rigid standard dose of one drug prescribed without variation. This thought, conceived before the present study began, was substantiated by experience with many cases in which the usual doses of phenobarbital were given with disappointing results and in which larger doses of phenobarbital, dilantin sodium or combined phenobarbital and dilantin sodium produced gratifying benefit.

CONCLUSIONS

1. Phenobarbital in doses up to $11\frac{1}{4}$ grains a day over a prolonged period of time can be safely administered with marked benefit to many patients with epilepsy.
2. Dilantin sodium is of distinct value in some cases in which large doses of phenobarbital produce little or no beneficial anticonvulsant effects and should be tried when phenobarbital produces uncontrollable apathy. Dilantin sodium produces no sedative effect except in toxic doses.
3. A combination of phenobarbital and dilantin sodium often produces most gratifying results where phenobarbital or dilantin sodium alone gives little benefit or is ineffectual.

CORRECTION OF PROTHROMBIN DEFICIENCIES

BY MEANS OF 2-METHYL-1, 4-NAPHTHOQUINONE
INJECTED INTRAMUSCULARLY

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We wish to report our experience with a very simple method of producing prompt restoration of the plasma prothrombin in the absence of liver damage.

The material that we have employed during the past six months is synthetic 2-methyl-1, 4-naphthoquinone, which Ansbacher and Fernholz¹ have shown to possess marked vitamin K activity. This substance is being administered orally in small amounts for prothrombin deficiencies in several clinics without toxic effects, but Koller² noted nausea and vomiting when as much as 3 mg. per kilogram of body weight was administered. It appeared to us that if the material could be given intramuscularly its absorption would be assured and its effects might be prolonged. Macfie, Bacharach and

Types of Cases in Which Therapy Was Employed

Diagnosis	Number of Cases	Response in Percentage of Normal
Obstructive jaundice due to stone.....	10	10-48
Hemorrhagic disease of newborn (dose of 0.35 to 1 mg.).....	6	10-30
Carcinoma of stomach.....	3	10-20
Carcinoma of head of pancreas.....	2	40
Cirrhosis of the liver.....	2	Continued to fall
Thrombasthenia.....	1	28
Empyema, sepsis.....	1	35
"	1	6
"	1	47
"	1	12

Chance³ have more recently reported beneficial effects from the intramuscular injection of this substance in doses of from 5 to 10 mg. daily.

The material is dissolved in corn oil and sealed in 2 cc. ampules, each cubic centimeter of the solution containing 1 mg. of 2-methyl-1, 4-naphthoquinone. The ampules are then sterilized in the autoclave at 20 pounds pressure for one hour and opened as required.

Since earlier studies⁴ indicated that doses of from 50 to 100 mg. of the substance were toxic when injected into dogs, we first carried out a series of experiments on rats, injecting 0.5 mg. of naphthoquinone in 0.5 cc. of corn oil intramuscularly and studying the muscles at intervals, but were unable to detect any local or systemic effects of a deleterious nature. We then injected doses of 2 mg. into dogs and found remarkably prompt and prolonged effects on the prothrombin. In a dog with a preinjection plasma prothrombin level of 50 per cent by the test devised by Warner, Brinkhous and

Smith,⁵ a single injection of 2 mg. of 2-methyl-1, 4-naphthoquinone raised the prothrombin level to 80 per cent, and eighteen days elapsed before it again fell. Tage-Hansen⁶ found similarly prolonged effects when from 150,000 to 400,000 units of purified vitamin K was injected intramuscularly. Our experiments on animals indicate that the effects may begin to be evident as early as eight hours after injection.

Since Oct. 1, 1939, we have administered 2-methyl-1, 4-naphthoquinone intramuscularly to twenty-eight patients with initial prothrombin levels of from 5 to 70 per cent of normal. Each adult patient received 2 mg., except three who were given 4 mg. of 2-methyl-1, 4-naphthohydroquinone dipropionate, which is one half as potent, and the infants received from 0.35 to 1 mg. In twenty-six of the twenty-eight cases this was followed by a prompt rise of the plasma prothrombin level. The two individuals in whom it was ineffective had marked liver damage, which has been found to interfere with the production of prothrombin.⁷ These patients also failed to respond to double the amount at repeated intervals.

In many instances a single dose was sufficient to restore the prothrombin to a satisfactory level, and in most the higher value was maintained for from several days to a week; but in several instances the injection was repeated at intervals of three days with beneficial effect. The types of cases in which this therapy was employed and the response in percentage of normal level obtained to a single injection of 2-methyl-1, 4-naphthoquinone (or the equivalent 4 mg. of the dipropionate) are listed in the accompanying table.

The routine which we now employ for patients with lowered plasma prothrombin is as follows:

If such patients are bleeding on admission to the hospital, transfusions are given both to restore the blood lost and as a means of administering prothrombin directly.

All patients with plasma prothrombin levels below 70 per cent immediately receive 2 mg. of 2-methyl-1, 4-naphthoquinone intramuscularly and the response after twenty-four and forty-eight hours is noted. If the prothrombin level is still below 70 per cent, the injection is repeated at intervals of three days, until the normal value is restored. In our experience at most two or three injections suffice to produce the desired result unless severe liver damage is present. Since we have been interested particularly in the quantitative response, we have employed small but adequate doses, but we can see no reason for hesitating to use more frequent injections or possibly to double the amount should these be indicated.

CONCLUSIONS

From the experience outlined as well as from our experiments made on animals, the following conclusions are drawn:

1. The intramuscular injection of 2-methyl-1, 4-naphthoquinone dissolved in corn oil is a simple and

This study was carried out under a grant from the John and Mary R. Markle Foundation.

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1. Ansbacher, S., and Fernholz, Erhard: Simple Compounds with Vitamin K Activity, *J. Am. Chem. Soc.* **61**: 1924 (July) 1939.

2. Koller, F.: Ueber die klinische Wirksamkeit von Naphthochinon-derivativen (Vitamin K-Wirkung), *Schweiz. med. Wchnschr.* **69**: 1159 (Nov. 11) 1939.

3. Macfie, J. A.; Bacharach, A. L., and Chance, M. R. A.: The Vitamin K Activity of 2-Methyl-1,4-Naphthoquinone and Its Clinical Use in Obstructive Jaundice, *Brit. M. J.* **2**: 1220 (Dec. 23) 1939.

4. Black, A.: Personal communication to the authors.

5. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: Quantitative Study on Blood Clotting: Prothrombin Fluctuations Under Experimental Conditions, *Am. J. Physiol.* **114**: 667 (Feb.) 1936.

6. Tage-Hansen, Erik: Summary of Some Clinical Studies on Vitamin K, *J. A. M. A.* **113**: 1875 (Nov. 18) 1939.

7. Smith, H. P.; Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and Bleeding Tendency in Liver Injury (Chloroform Intoxication), *J. Exper. Med.* **66**: 801 (Dec.) 1937. Lord, J. W. Jr.: Effect of Trauma to Liver on Plasma Prothrombin: Experimental Study, *Surgery* **6**: 896 (Dec.) 1939.

Andrus, W. deW.; Lord, J. W. Jr.: Effect of Hepatectomy on Plasma Prothrombin and Vitamin K, *Surgery* **6**: 899 (Dec.) 1939.

effective means of restoring the plasma prothrombin level in the absence of severe liver damage.

2. Single injections of as little as 2 mg. of this substance restore the level of plasma prothrombin by as much as 48 per cent, and the effect is evident as early as eight hours after injection.

3. The effect of a single injection may be prolonged for as long as a week, unless adverse factors such as operations on the biliary tract or other liver damage supervene.

4. No toxic effects have been noted resulting from doses of as much as 4 mg. in patients or in animals.
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THE USE OF CITRATED PLASMA IN THE TREATMENT OF SECONDARY SHOCK

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This paper is concerned with offering evidence of the effectiveness of human blood plasma in the treatment of secondary shock. This work is part of a general investigation conducted by members of the staff of the Bryn Mawr Hospital for the past several years concerning the rationale of the transfusion of whole blood and of plasma.

While we are not primarily concerned in this paper in the investigation of the mechanism of secondary shock, it is opportune to mention the causative factors underlying its production. The existence of any hypothetical toxic substance responsible for secondary shock, as suggested by Cannon,¹ has not been confirmed by the experimental work of Blalock and his associates² and of O'Shaughnessy and Slome.³ The initiating factors are various and include bleeding at the site of injury (external and/or internal⁴), loss of plasma in the traumatized tissue,⁵ loss of plasma followed by hemoconcentration in burns and in trauma to the intestine,⁶ cold, fear, pain, asphyxia, infection, dehydration, in brief, all stimuli leading to hyperactivity of the sympathetic nervous system and vasoconstriction with consequent relative asphyxia of the peripheral tissues and increased permeability of the capillaries, with loss of blood plasma resulting in a loss of blood

volume.⁷ It is generally admitted that this decrease in the volume of circulating blood is the essential lesion in secondary shock. The following working definition may be accepted: "Shock is the clinical condition characterized by progressive loss of circulating blood volume, brought about by the tissue anoxia which results from inadequate circulation."⁸

In view of this premise it appears obvious that the ideal therapeutic agent would be the one enabling the attending physician to increase rapidly and permanently the patient's blood volume. To this purpose transfusion of whole blood has been the best answer. Substitutes to blood transfusion in the treatment of secondary shock have so far generally failed. Thus physiologic solution of sodium chloride and dextrose solution, which are readily available, do not produce a permanent increase in the circulating blood volume, as in the majority of cases they rapidly leave the circulation.⁹ The use of acacia solution,⁹ although more effective than physiologic solution of sodium chloride in maintaining circulating blood volume,¹⁰ is often followed by severe reactions.¹¹

On close analysis, however, whole blood is not the ideal agent. There are two essential drawbacks, which have been emphasized by Mahoney:¹² first, the interval of time necessary to make whole blood available for transfusion and, second, the undesirable addition of red cells to the already concentrated blood. The latter is especially evident in burns.

The employment of citrated blood preserved by refrigeration promised to be for a time a partial solution to the first objection. Recent studies, however, in our own laboratories¹³ suggest that the period of useful and safe preservation is no more than five days. Other workers have recently placed the period of useful preservation of citrated blood up to ten days.¹⁴ Even when a blood donor of suitable type is available or refrigerated blood is on hand, at least one hour is required for proper cross matching (collection of specimen from donors and patient, separation of serum, cross matching and the like). The usefulness of citrated preserved blood is further limited by the fact that it cannot be transported, because mechanical agitation greatly hastens the breakdown of erythrocytes. In addition to these drawbacks, one must consider the occurrence of post-transfusion reactions. Generally these occur in from 5 to 10 per cent of cases. In shock, however, owing to the emergency and the temptation to hasten the preliminary steps in the preparation of blood and to increase the speed of administration, reactions are even more common. Severe reactions usually due to hemolysis are relatively rare, and the incidence of death directly attributable to blood transfusion in

From the Laboratory of Clinical Pathology of the Bryn Mawr Hospital. The cost of this investigation has been defrayed in part by the Research Fund of the Women's Board of the Bryn Mawr Hospital.

The members of the staff of the Bryn Mawr Hospital, particularly Drs. C. H. Behney, A. E. Billings, J. B. Flick, L. Herman, J. L. Richards and J. S. Rodman, gave the authors permission to use the records of the clinical cases reported.

1. Cannon, W. B.: *Traumatic Shock*, New York, D. Appleton & Co., 1923.

2. Blalock, Alfred, and Bradburn, Hubert: Distribution of the Blood in Shock: the Oxygen Content of the Venous Blood from Different Localities in Shock Produced by Hemorrhage, by Histamine and by Trauma, *Arch. Surg.* **20**: 26 (Jan.) 1930. Blalock, Alfred: Experimental Shock: The Cause of the Low Blood Pressure Produced by Muscle Injury, *ibid.* **20**: 959 (June) 1930.

3. O'Shaughnessy, Laurence, and Slome, David: The Etiology of Traumatic Shock, *Brit. J. Surg.* **22**: 589 (Jan.) 1935.

4. Blalock, Alfred: Shock, Further Studies with Particular Reference to the Effects of Hemorrhage, *Arch. Surg.* **29**: 837 (Nov.) 1934.

5. Blalock, Alfred: Experimental Shock: Probable Cause for the Reduction in Blood Pressure Following Mild Trauma to an Extremity, *Arch. Surg.* **22**: 589 (April) 1931.

6. Beard, J. W., and Blalock, Alfred: Experimental Shock: The Composition of the Fluid that Escapes from the Blood Stream After Mild Trauma to an Extremity, After Trauma to the Intestines and After Burns, *Arch. Surg.* **22**: 617 (April) 1931.

7. Freeman, N. E.: Decrease in Blood Volume After Prolonged Hyperactivity of the Sympathetic Nervous System, *Am. J. Physiol.* **103**: 185 (Jan.) 1933.

8. Freeman, N. E., in Stroud, W. D.: *Cardiovascular Diseases and Their Treatment*, Philadelphia, F. A. Davis Company, to be published.

9. Mann, F. C.: Experimental Surgical Shock: The Treatment of the Condition of Low Blood Pressure Which Follows Exposure of the Abdominal Viscera, *Am. J. Physiol.* **50**: 86 (Oct.) 1919.

10. Erlanger, J., and Gasser, H. S.: Studies in Secondary Traumatic Shock: Note on the Action of Hypertonic Gum Acacia and Glucose After Hemorrhage, *Am. J. Physiol.* **50**: 149 (Oct.) 1919; *Id.*: Statistical Study of the Treatment of Measured Trauma with Solutions of Gum Acacia and Crystalloids, *ibid.*, p. 119.

11. Studdiford, W. E.: Severe and Fatal Reactions Following Intravenous Use of Gum Acacia Glucose Infusions, *Surg., Gynec. & Obst.* **64**: 722 (April) 1937.

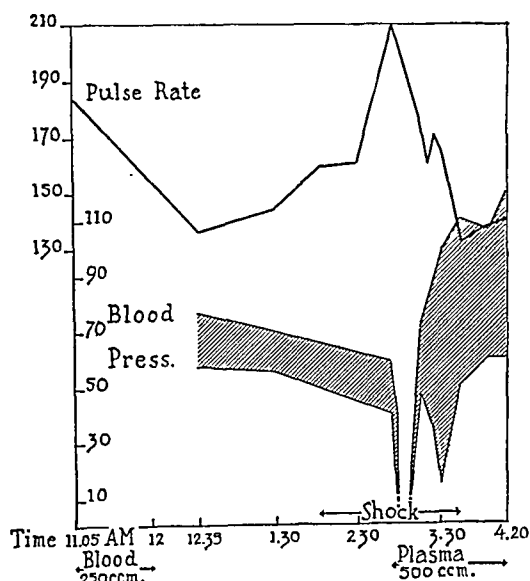
12. Mahoney, E. B.: Experimental and Clinical Shock, with Special Reference to Its Treatment by Intravenous Injection of Preserved Plasma, *Ann. Surg.* **108**: 178 (Aug.) 1938.

13. Strumia, M. M.: The Fate of Transfused Refrigerated Blood, to be published.

14. Transfusion of Preserved Blood, editorial, *J. A. M. A.* **113**: 2961 (Dec. 2) 1939.

the United States is variously placed at from 0.13 per cent by Tiber¹⁵ to 0.20 per cent by DeGowin.¹⁶

Bond and Wright¹⁷ employed lyophile serum in the treatment of experimental shock in animals. They concluded that serum is capable of raising and maintaining the blood pressure for several hours. More recently Levinson,¹⁸ employing serum in dogs, found it an effective agent in combating secondary shock resulting from severe hemorrhage. Mahoney,¹² employing lyophile plasma in the treatment of experimental shock in animals, concluded that it was more efficient than blood, physiologic solution of sodium chloride or acacia solution in restoring the normal blood pressure. Elliott¹⁹ and Lehman²⁰ mentioned the use of plasma in the treatment of shock. McClure²¹ used plasma and/or serum to restore the loss of blood plasma in burns. Fantus²² suggested the use of plasma in shock without hemorrhage, in burns and in certain hemorrhagic conditions. No statement is made as to its actual use. Darrow²³ mentions the use of blood or plasma in shock.



Pulse rate and blood pressure curves in case 1.

More recently Brodin and Saint Girons²⁴ stressed the use of plasma in severe hemorrhage. The use of plasma in the treatment of shock is also reported by Tatum and his associates.²⁵

It will be noted that most of the experimental workers who are cited used serum. We have pointed out the

many advantages of citrated plasma over serum.²⁶ They may be briefly summarized as, first, the greater yield of the fluid portion when citrated plasma is separated by centrifugation, and, second, the all important freedom from reactions, often severe, occurring when serum is employed intravenously.²⁶

In the present work citrated plasma was used exclusively. Details for the separation of plasma are given elsewhere.²⁶ Briefly, blood is mixed with a 2 per cent solution of sodium citrate in physiologic solution of sodium chloride in the proportion of 100 cc. of citrated saline solution to 500 cc. of blood. Plasma is separated by suction after centrifugation and may be used fresh or stored at 4 C. after addition of merthiolate solution 1:10,000. Practically, at the Bryn Mawr Hospital most of the plasma is a by-product of the blood bank. At the end of five days of preservation the plasma is separated, pooled and stored. No cross matching is necessary, but of course each lot is tested serologically by means of the Wassermann and Kahn tests.

The following are abstracts of reports of ten typical clinical cases selected out of a large number:

REPORT OF CASES

CASE 1.—A white woman aged 30 was admitted to the hospital with a diagnosis of multiple fibromyomas. Myomectomy was performed and the patient left the operating room at 10:40 a. m. in good condition; at 11:05 her pulse rate was 184 and her respiratory rate 24 a minute. Because of a slight loss of blood during the course of the operation a transfusion of 250 cc. of citrated blood was started. At 1:30 p. m. her pulse rate was 144 and her blood pressure 70 systolic, 56 diastolic. The patient became progressively weaker and at 2:55 her pulse rate was over 200 and her blood pressure 59/40. In the succeeding ten minutes her blood pressure was not obtainable and the patient appeared in a state of deep shock (the course of the pulse and blood pressure is shown in the chart). At 3 o'clock 500 cc. of a solution consisting of equal parts of plasma and physiologic solution of sodium chloride was started intravenously in conjunction with routine measures. At 3:30 the patient had received 500 cc. of the mixture and was decidedly improved; the pulse rate was 164 and the blood pressure 100/60. The patient steadily improved from shock and made an uneventful recovery.

CASE 2.—A white woman aged 34 had a cholecystectomy performed for chronic cholecystitis with cholelithiasis on Sept. 18, 1939, and was returned to the ward in good condition at 12:50 p. m. At that time her pulse was 120 and her blood pressure 164/116. She was given a total of 2,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride intravenously between 12:50 and 7:30, together with morphine sulfate one-sixteenth grain (0.01 Gm.) but her blood pressure steadily fell, so that at 7:30 it was 104/78 and her pulse rate 126. At 10 o'clock her blood pressure was not obtainable and she showed all the clinical signs of severe shock and was given routine treatment. At midnight she was adjudged critically ill. The blood pressure was still not obtainable and the pulse rate was 140 a minute. At 12:20 a. m. 250 cc. of undiluted plasma was begun, which was absorbed at 1:15, and then an equal quantity of citrated blood was started. At this time, her pulse rate was still 144, but her blood pressure was now 105/84 and the general conditions were definitely improved. At 2 o'clock the patient became rational and rapidly recovered from the state of severe post-operative shock.

CASE 3.—A white woman aged 58 was admitted to the hospital at 12:30 p. m., Dec. 16, 1938, with acute intestinal obstruction. At that time her pulse rate was 100 and her blood pressure 88/54. Her white cell count was 15,300 with 76 per cent polymorphonuclear neutrophils, blood urea nitrogen 62 and carbon dioxide combining power 42 volumes per cent. She was

15. Tiber, A. M.: Observations on Blood Grouping and Blood Transfusion, *Ann. Surg.* 91:481 (April) 1930.

16. DeGowin, E. L.: Grave Sequelae of Blood Transfusions: A Clinical Study of Thirteen Cases Occurring in 3,500 Blood Transfusions, *Ann. Int. Med.* 11:1777 (April) 1938.

17. Bond, D. D., and Wright, D. G.: The Treatment of Hemorrhage and Traumatic Shock by the Intravenous Use of Lyophile Serum, *Ann. Surg.* 107:500 (April) 1938.

18. Levinson, S. O.; Neuwelt, Frank, and Nechels, Heinrich, with the collaboration of Cohn, D. J., and the technical assistance of Olson, W. H., and Lawrence, Grace: Human Serum as a Blood Substitute in the Treatment of Hemorrhage and Shock, *J. A. M. A.* 114:455 (Feb. 10) 1940.

19. Elliott, J.: A Preliminary Report of a New Method of Blood Transfusion, *South. Med. & Surg.* 98:643 (Dec.) 1936.

20. Lehman, E. P.: A Simple Method of Plasma Transfusion, *J. A. M. A.* 112:1406 (April 8) 1939.

21. McClure, R. D.: The Treatment of the Patient with Severe Burns, *J. A. M. A.* 113:1809 (Nov. 11) 1939.

22. Fantus, Bernard: The Therapy of the Cook County Hospital: Blood Preservation, *J. A. M. A.* 109:128 (July 10) 1937.

23. Darrow, D. C.: The Treatment of Dehydration, Acidosis and Alkalosis, *J. A. M. A.* 114:655 (Feb. 24) 1940.

24. Brodin, P., and Saint Girons, F.: Plasma Transfusion, Paris letter, *J. A. M. A.* 113:2072 (Dec. 2) 1939.

25. Tatum, W. L.; Elliott, J., and Nessel, N.: A Technic for the Preparation of a Substitute for Whole Blood Adaptable for Use During War Conditions, *Mil. Surgeon* 85:481 (Dec.) 1939.

26. Strumia, M. M.; Wagner, J. A., and Monaghan, J. F.: The Intravenous Use of Serum and Plasma, Fresh and Preserved, *Ann. Surg.* to be published.

treated with the Wangenstein drainage and in the routine manner for shock. At 9 o'clock she had received 2,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride intravenously and was taken to the operating room for laparotomy under spinal anesthesia, at which time her blood pressure was 95/60. A large volvulus was found which necessitated the resection of approximately 240 cm. of small intestine. At 9:35, during the course of the operation, her blood pressure fell to 40/30 and at times was not obtainable. The patient appeared clinically in a state of shock. At this point the administration of 500 cc. of plasma plus 300 cc. of physiologic solution of sodium chloride was begun intravenously. The operation was finished at 10:25, at which time the blood pressure was 150/60. The patient made a complete recovery from the state of shock.

CASE 4.—A white man aged 45 was admitted to the accident ward at 7:50 p. m., Nov. 16, 1939, with a diagnosis of perforated peptic ulcer. At 9 o'clock his blood pressure was 80/20 and his white cell count was 12,750 with 85 per cent polymorphonuclear neutrophils. An x-ray examination showed free gas beneath the diaphragm. The patient was taken to the operating room at 10 o'clock for laparotomy under spinal anesthesia. During the course of the operation his blood pressure fell to 30/10 and 5 per cent dextrose in physiologic solution of sodium chloride was begun intravenously. The operation was completed at 11 o'clock and by midnight the patient had received 2,000 cc. of the dextrose-saline solution. The blood pressure at this point was 90/48. The pulse was weak, with a rate of 100 a minute; the patient was profusely perspiring and appeared to be in a state of shock. Two hundred and fifty cc. of plasma diluted with 500 cc. of saline-dextrose solution was given intravenously and at 2:15 a. m. the blood pressure was 120/80 and the patient had definitely recovered from the state of shock.

CASE 5.—A white man aged 63 was brought to the accident ward at 11:30 a. m. on June 1, 1939, after he had been picked up by the claws of a steam shovel and dropped into a truck with dirt and stones. He had fractures of twelve ribs with hemothorax, and compound fractures of the right tibia and fibula. He immediately received routine prophylactic treatment for shock. On return from the x-ray department at 12:30 p. m. his pulse rate was 64 and his blood pressure 94/54. He was given 1,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride intravenously and at 3:30, although his blood pressure was still 98/50, he appeared clinically in shock. Five hundred cc. of undiluted plasma was started intravenously. At 4 o'clock his blood pressure was 110/50 and at 6:30 it was 130/50, by which time the clinical manifestations of shock had disappeared.

CASE 6.—A white boy aged 11 years was brought to the accident ward at 3 p. m., April 7, 1939, having suffered a traumatic amputation of both legs above the knees, with considerable loss of blood. The patient was given external heat, morphine sulfate one eighth grain (0.008 Gm.) and 5 per cent dextrose in physiologic solution of sodium chloride intravenously. At 3:40 the pulse rate was over 140, the respiratory rate 28 and the blood pressure 58/40, and the patient appeared to be in a state of shock. Débridement without anesthesia and the intravenous administration of plasma diluted with an equal amount of physiologic solution of sodium chloride were started. At 4 o'clock, on leaving the operating room, the pulse rate was still over 140, but the blood pressure was 67/40. At 4:25 the patient had received 300 cc. of plasma, at which time the pulse rate was 132 and respiratory rate 28. The blood pressure at 4:45 was 110/40 and the patient was definitely improved. Blood having become available in the meantime, a transfusion of whole blood was begun. The child was completely recovered from shock by 5:30, long before the transfusion was completed.

CASE 7.—A white man aged 77 was admitted to the hospital with the diagnosis of benign prostatic hypertrophy. A first stage suprapubic cystostomy was performed on August 8, followed by prostatectomy under spinal anesthesia on August 21. The operation was successful and the patient was returned to his room in good condition at 3:30 p. m. The pulse rate was

120 and the blood pressure 124/64. Between 3:30 and 6 o'clock the patient complained of a chilly sensation and his pulse became weaker. There was moderate bleeding from the wound. At 6 o'clock the pulse rate was 160, the blood pressure 40/? and clinical signs of shock were present. The bladder was immediately packed and shortly thereafter, in conjunction with the routine care, the administration of undiluted plasma was begun intravenously. At 7:30, 650 cc. of plasma had been administered and the patient was definitely improved, the pulse rate being 160, but of better volume, and the blood pressure having risen to 65/40. At this time, whole blood being available, its administration was begun. The patient recovered from the state of shock.

CASE 8.—A white man aged 72 was admitted to the accident ward at 11:55 p. m. on Oct. 19, 1939. He had been struck by an automobile and had suffered comminuted fractures of both bones of both lower legs. The fractures of the left leg were compound and required subsequent amputation of the leg. There was a moderate loss of blood. The patient was in a state of alcoholic intoxication, irrational and in profound shock. He was treated in the routine manner and at 1:10 a. m., when in a critical condition, intravenous administration of 500 cc. of undiluted blood plasma was started. At this time the patient was pulseless and blood pressure was not obtainable. At 1:30 his temperature was 95 F. and the blood pressure 40/24. At 2 o'clock the 500 cc. of blood plasma had been absorbed, the patient's condition was greatly improved, his respiratory rate being 28 per minute and his blood pressure 40/32. At the same time transfusion of 500 cc. of whole blood was begun. His progress continued satisfactorily and he made a complete recovery from the state of shock.

CASE 9.—A white woman aged 35, extremely obese (137 cm. in height and weighing 127 Kg.), was admitted to the accident ward at 10:15 a. m., March 21, 1939, after she had been in labor twenty-four hours. Her membranes had ruptured seventy-two hours previously, her uterus was ruptured and she also had a strangulated, incarcerated ventral hernia. Examination on admission showed a temperature of 99.4 F., a pulse rate of 116 and a blood pressure of 132/82. The patient was given 1,500 cc. of 5 per cent dextrose in physiologic solution of sodium chloride and taken to the operating room at 7:30 p. m. Her pulse rate was then 134 and the blood pressure had dropped to 115/30. With the advance knowledge of a prolonged operation on an extremely obese, exhausted woman, with previous hemorrhage and extensive necrotizing lesions, and the immediate danger of shock and the possibility of its prevention, the patient was given 750 cc. of undiluted plasma intravenously during the course of the operation; that is, between 7:40 and 10:15. During the operation her blood pressure rose to 160/110 (nearly her normal), and the patient made an uneventful recovery.

CASE 10.—A white youth aged 18 was admitted to the accident ward on Nov. 18, 1939, at 4:45 p. m. He had a compound fracture of the left ankle with considerable loss of blood, the result of a motorcycle accident. On admission, his blood pressure was 124/90 and the pulse rate was 88. He was treated prophylactically for shock in the routine fashion and after roentgenographic examination was sent to the operating room for débridement under gas-ether anesthesia at 6:35. At this time the pulse rate was 120 and the patient was clinically in a state of mild shock. At 8 o'clock he was given 1,000 cc. of a solution consisting of equal parts of plasma and physiologic solution of sodium chloride; at 9 o'clock the pulse rate was 110, with good volume, the blood pressure was 130/98 and the clinical signs of shock had disappeared.

Cases 1 to 4 are instances of postoperative shock not accompanied by excessive loss of blood. The administration of plasma initiated rapid recovery in all cases and was sufficient in itself to complete recovery in three of them. In case 2 the administration of 250 cc. of plasma caused a very definite improvement in the patient's condition. The treatment was continued with the administration of 250 cc. of blood, although plasma alone would probably have had a similar effect. It is

to be noted that in case 1 a transfusion of 250 cc. of whole blood did not prevent the onset of severe shock and that in cases 3 and 4 the intravenous administration of 2,000 cc. of 5 per cent dextrose-saline solution had apparently no effect in preventing shock.

Case 5 is a typical instance of severe traumatic shock without visible loss of blood, rapid and complete recovery following administration of plasma alone.

Case 6 is an instance of traumatic shock accompanied by severe loss of blood. Administration of plasma rapidly and efficiently contributed to the restoration and maintenance of the circulation until whole blood was made available. It is to be noted however that, even in the presence of severe hemorrhage, plasma alone was sufficient to combat shock.

Cases 7 and 8 are instances of postoperative shock and traumatic shock, respectively, with relatively small losses of blood. In both cases plasma efficiently contributed to initiate and maintain recovery until whole blood was made available. It is very likely that in both cases the administration of whole blood was superfluous.

Cases 9 and 10 represent the very numerous types of cases in which the traumatic lesion is of such a nature and extent that it often leads to shock. One of the two cases (case 10) actually presented clinical evidence of early shock. The administration of plasma in these cases, particularly before operation, eliminates the danger of sudden postoperative collapse.

Routine treatment for shock referred to in these reports consists essentially of placing the patient in the Trendelenburg position, the application of heat, the administration of a narcotic and usually the intravenous administration of physiologic solution of sodium chloride with 5 per cent dextrose. This routine treatment, without the intravenous administration of plasma or whole blood, has on many occasions proved insufficient in the treatment of shock.

Concerning the dosage, it may be generally stated that it must be sufficiently large to relieve entirely the symptoms of shock. The average dose is about 500 cc., but larger doses may be necessary in cases of severe involvement. The size of the patient and the severity of the circulatory deficiency are the factors determining the size of the dose.

The speed of administration depends also to a certain extent on the condition of the patient. It may be stated that it is safe to administer plasma by the gravity method, a gage 19 needle being used as fast as it will run, approximately 10 cc. a minute. We prefer generally to use the plasma diluted with an equal amount of saline-dextrose solution; this is, however, not essential.

Heating of the plasma in any way is to be carefully avoided. Administration of cold plasma does not cause any reaction. For other details concerning the use of plasma the reader is referred to our previous paper.²⁶

SUMMARY AND COMMENT

Plasma appears to be from all standpoints the ideal material for the permanent reestablishment of proper circulation in secondary shock. Because of the protein content and the consequent high colloidal osmotic pressure,²⁷ plasma does not leave the circulation, as crystalloid solutions do, and therefore with its use it is possible to regulate effectively the volume of circulating

blood. The advantages of plasma may be summarized as follows:

1. It is readily obtained from citrated blood by the simple process of centrifugation, with a high yield of the liquid phase. It can be pooled and stored for use after the necessary serologic tests for syphilis are carried out. When a blood bank is in operation, plasma can be separated on expiration of the useful period of preservation, preferably five days. With reasonable care, sterility tests are not necessary.

2. It is always ready for immediate use, without preliminary preparation, such as typing and cross matching.

3. Its use is simple, safe and free of reactions. Very large and repeated doses at any interval of time can be given without untoward effect.

4. It can be readily transported, as it is not affected by shaking, and can be preserved in a variety of ways. With the addition of a preservative (merthiolate solution 1:10,000), it can be kept at room temperature for a number of days. At 4 C. the protein content of plasma, and therefore its antishock properties, can be preserved for months. In the frozen state it can be preserved for even a longer period. Finally, reduced to a dry powder by desiccation from the frozen state ("lyophile" or "cryochem" process²⁸), it can be kept for an indefinite period of time and readily prepared for use by regeneration with distilled water.

5. It does not add to concentration of erythrocytes.

6. Its practical use in secondary shock has shown its efficiency in the rapid restoration of proper circulation in cases of the most severe involvement, even those accompanied by a very large loss of blood. The latter point, emphasized by Levinson,¹⁸ is very important. In cases of severe hemorrhages the loss of erythrocytes is a relatively secondary factor, one which contributes but little to the state of shock, provided the volume of circulating blood is maintained at a proper level. Case 6 exemplifies this type of case.

With the use of plasma it is possible to avoid altogether the emergency blood transfusion, with its unavoidable serious delays and the dangers due to hurried preparations, often at the hands of improperly trained persons, and to the rapid administration. A suggested routine is to administer to all patients with severe injuries, regardless of the loss of blood, sufficient plasma to secure recovery from shock or, if shock is not present, to prevent its occurrence. Later on, when blood dilution has taken place, the actual degree of anemia can be estimated, and transfusion with whole blood resorted to if considered essential to recovery or, as more commonly occurs, useful to shortening the period of convalescence. In the average hospital the establishment of a plasma bank with preservation of the material at 4 C. is a simple and efficient method for the maintenance of an adequate supply on hand. As already stated, if a blood bank is in operation plasma can be separated from the lots of blood that have not been used within the maximum period of preservation. A plasma bank, however, is readily operated and useful even in smaller institutions where establishment of a blood bank is not practicable.

Whenever large quantities of plasma need to be stored over a long period or transported under adverse conditions, the advantages of the preservation by drying from

27. Freeman, N. E., and Wallace, W. M.: The Effect of Concentrated Serum on Plasma Volume and Serum Protein Concentration, *Am. J. Physiol.* 124: 791 (Dec.) 1938.

28. Floesdorf, E. W., and Mudd, Stuart: Procedure and Apparatus for Preservation in Lyophile Form of Serum and Other Biological Substances, *J. Immunol.* 29: 389 (Nov.) 1935; An Improved Procedure and Apparatus for Preservation of Sera, Micro-Organisms and Other Substances, *Cryochem-Process*, *ibid.* 34: 429 (June) 1938.

the frozen state ("lyophile" or "cryochem" process) are self evident. (Elser, Thomas and Steffen;²⁹ Flossdorf and Mudd²⁸). We have pointed out that the reactions, reported by several observers,²⁶ following the administration of "lyophile" serum intravenously are due not to a change induced by the process of desiccation but to the use of serum. Lyophile or cryochem plasma causes no reactions. Desiccated serum when administered intravenously in a concentrated form has also been found effective in reducing the intracranial pressure (Hughes, Mudd and Strecker;³⁰ Wright, Bond and Hughes³¹).

World War experience has pointed out that shock plays an important role in the high death rate occurring during the first twelve hours after injury. Under the conditions of life of soldiers in first line duty, during prolonged action, shock is particularly apt to occur, because of the state of depleted reserves from which most of the men suffer, together with the abnormal nervous conditions. This observation has been repeatedly made. Robertson,³² together with many other investigators, studied the problem during the World War, and he is usually credited as having been the first to use refrigerated preserved blood for transfusions. Of the twenty patients treated, nine died. During the recent Spanish civil war refrigerated blood was extensively used in combating shock.³³ A true estimate of its usefulness is lacking. We have already pointed out some of the drawbacks to the use of refrigerated blood. On the field these difficulties would become tenfold greater. The use of type O blood exclusively is only a partial help. The most serious difficulty is offered by the problem of preservation of the blood and of transportation, since it is well known that agitation of preserved refrigerated blood readily causes hemolysis. Under these conditions the advantages offered by the use of plasma, preserved in any of the ways mentioned, appears obvious. The same may be said of its use in disasters involving similar field work. Heinatz and Sokolow³⁴ found that plasma can be preserved for three months and recommend that plasma of the AB group be kept on hand in all hospitals.

CONCLUSIONS

1. The intravenous administration of citrated blood plasma has proved to be an ideal means of restoring an adequate blood circulation in patients suffering from secondary shock, rapidly relieving the clinical manifestations.

2. The advantages offered by citrated blood plasma are that: (a) it can be readily prepared and safely transported, (b) it can be stored for an indefinite period of time, (c) it is entirely safe and free from reactions, (d) it can be used in large and repeated doses, (e) it is ready for instant use, and (f) it does not add to concentration of erythrocytes if this condition is present.

29. Elser, W. J.; Thomas, A. R., and Steffen, G. L.: The Desiccation of Sera and Other Biological Products, Including Micro-Organisms, in the Frozen State with Preservation of the Original Qualities of Products So Treated, *J. Immunol.* **25**: 433 (June) 1938.

30. Hughes, Joseph; Mudd, Stuart, and Strecker, E. A.: Treatment of Increased Intracranial Pressure by Concentrated Human Lyophile Serum, *Tr. Am. Neurol. A.* **62**: 118, 1936; Reduction of Increased Intracranial Pressure by Concentrated Solutions of Human Lyophile Serum, *Arch. Neurol. & Psychiat.* **39**: 1277 (June) 1938.

31. Wright, David; Bond, Douglas, and Hughes, Joseph: Reduction of Cerebrospinal Fluid Pressure by Concentrated Lyophile Serum, *Arch. Neurol. & Psychiat.* **39**: 1288 (June) 1938.

32. Robertson, O. H.: Transfusion with Preserved Blood Cells, *Brit. M. J.* **1**: 691 (June 22) 1918.

33. Maisonneuve and Jeanneney: Use of Refrigerated Blood for Armies, *Paris letter, J. A. M. A.* **111**: 1311 (Oct. 1) 1938.

34. Heinatz, S. W., and Sokolow, N. L.: Plasma Transfusion as Method of Choice in Treatment of Hemolytic Shock, *Zentralbl. f. Chir.* **62**: 1753 (July 27) 1935.

Clinical Notes, Suggestions and New Instruments

THE PROTHROMBIN CHANGES IN BANKED BLOOD

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The use of refrigerated blood is of intense interest to most physicians and at the present time a scheme for its management has been worked out. From the beginning of the use of such blood at the Mayo Clinic the amount of blood in the refrigerator at any one time has been minimized to a small enough quantity so that each day or two fresh blood will be collected and placed in the refrigerator. It is only occasionally that blood which has been in the icebox for many days is used. The desire to study the quality of older blood and relatively fresh blood has led us to investigate several properties of blood and how they are altered by short chilling and prolonged chilling. The blood is citrated and kept in the refrigerator at a temperature of 34 F. in a 500 cc. container used for intravenous administration. An interesting report on the prothrombin time of banked blood by Rhoads and Panzer¹ dealt with prothrombin time as estimated by a modification of Quick's method. It was thought best to check the results with those obtained by another method.

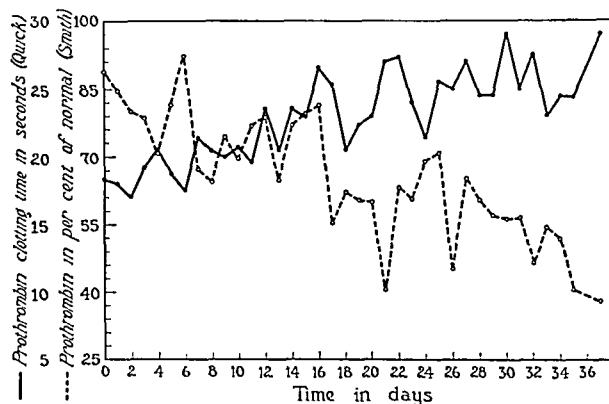


Chart 1.—Average prothrombin clotting time and percentage of prothrombin for each day.

The quantitative method for titration of prothrombin in blood, as developed by Smith and his associates,² has been employed by us for some time. Simultaneous determinations of prothrombin coagulation time, as described by Quick and his co-workers,³ have been made in nearly every instance with a fair degree of correlation.

In determining the prothrombin content in relation to the clotting time, a slight modification in technic was necessitated since the blood already had been citrated. In this work all blood used for normal controls was citrated in the same proportion as the banked blood. The percentage of prothrombin obtained was slightly less than that obtained with oxalated specimens of the same blood, owing possibly to the difference

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1. Rhoads, J. E., and Panzer, L. M.: The Prothrombin Time of "Bank Blood," *J. A. M. A.* **112**: 309-311 (Jan. 28) 1939.

2. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: A Quantitative Study on Blood Clotting: Prothrombin Fluctuations Under Experimental Conditions, *Am. J. Physiol.* **114**: 667-675 (Feb.) 1936. Smith, H. P.; Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and the Bleeding Tendency in Liver Injury (Chloroform Intoxication), *J. Exper. Med.* **66**: 801-811 (Dec.) 1937.

3. Quick, A. J.; Stanley-Brown, Margaret, and Baneroff, F. W.: A Study of the Coagulation Defect in Hemophilia and in Jaundice, *Am. J. M. Sc.* **100**: 501-511 (Oct.) 1935.

in dilution and to the presence of the citrate. However, the difference was less than 10 per cent and all results still held their same relative values in comparison with normal controls.

At the time of obtaining 500 cc. of blood from the donor, samples of 10 cc. each were drawn into sterile test tubes and kept in the refrigerator for from one to thirty-seven days.

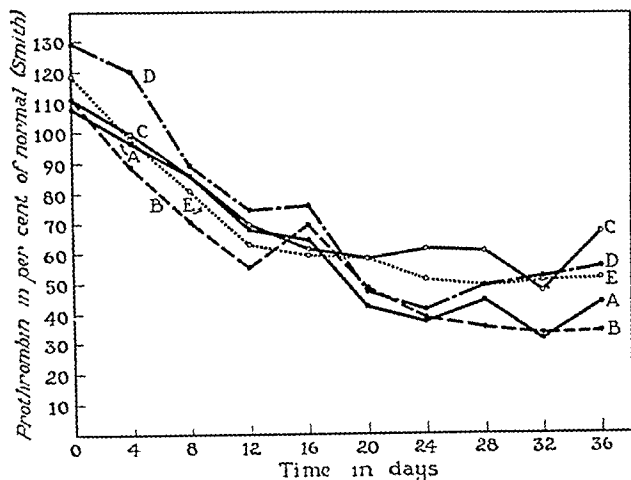


Chart 2.—Changes in prothrombin content of five specimens through thirty-six days.

When the allotted time had elapsed, the prothrombin content of the blood was determined by both the methods of Quick and of Smith and his associates as previously mentioned.

It was not possible to examine each specimen of blood for the entire thirty-seven days. However, 129 samples of blood were titrated after different time intervals. For the initial determinations, eleven samples were tested; from the first to the tenth day from four to five samples were tested each day; from the eleventh to the thirty-seventh day three samples were tested each day, with the exception of five days on which only two samples were available.

The average prothrombin coagulation time and the percentage of prothrombin was calculated for each day and the results obtained with both methods are shown in chart 1.

In spite of daily fluctuations in values, when the length of storage is increased there is observed a gradual decrease in the percentage of prothrombin determined by the method of Smith and his associates and a corresponding prolongation

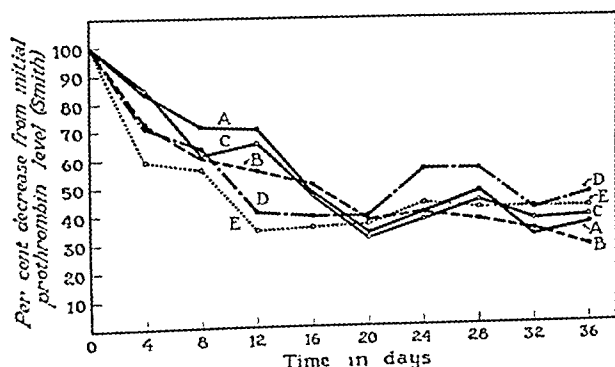


Chart 3.—Decrease in prothrombin content of five specimens calculated on basis of initial value of 100 per cent.

of prothrombin coagulation time is shown by the method of Quick. The percentage of prothrombin decreased from an initial average titration of 89 to 38 on the thirty-seventh day. The prothrombin time rose from an initial clotting time of eighteen seconds to twenty-nine seconds on the thirty-seventh day.

The correlation between the two methods is rather good, the variations obtained being largely accounted for by technical difficulties in the method itself.

This led to further experimentation in which five specimens of blood were tested for prothrombin content every four days for thirty-six days. The specimens of 100 cc. were divided into smaller samples in sterile test tubes and kept in the refrigerator under conditions similar to those in the case of banked blood. The prothrombin content was determined on each sample of fresh blood by the quantitative method (Smith and his associates).

The original hematocrit reading for each specimen was used in calculating the dilution factor throughout the experiment. Furthermore, the blood of the same individual was used for the normal control for each titration. In this way it was hoped to standardize the conditions of the test and to limit the variables to those in the method itself.

The changes in prothrombin content during the thirty-six days for each of the five specimens of blood are shown in chart 2. The prothrombin content is expressed as percentage of prothrombin present in comparison with a normal control for each day of titration.

To express these data in an additional manner, the percentage of decrease calculated on the basis of the initial value as 100 per cent is shown in chart 3.

Similar curves were obtained in these two instances and show a rapid decrease in prothrombin content during the first twelve days and a gradual leveling off at approximately 40 per cent thereafter.

While these data do not show as rapid a decrease in prothrombin content in banked blood as given by Rhoads and Panzer, it is demonstrated conclusively that a decrease does occur over a period of time to a level of 40 per cent of the original content. Hence it is concluded that, in cases in which it is desired to raise the prothrombin content of the blood by transfusion, old banked blood is not a suitable agent.

THE PROTHROMBIN IN PRESERVED BLOOD

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It has been repeatedly found in my laboratory that, when normal oxalated blood is placed in an ordinary refrigerator, a reduction of the prothrombin, occasionally as much as 50 per cent, may occur in twenty-four hours. Rhoads and Panzer,¹ using my method, have noted that even when blood is carefully preserved at 4 C. the prothrombin rapidly decreases. Lord and Pastore,² employing the method of Warner, Brinkhous and Smith,³ found on the contrary that the prothrombin was relatively little diminished in stored blood. Obviously a marked discrepancy exists between the two methods for determining prothrombin and this presents a problem which is not only of academic but of practical clinical importance as well.

Without entering into the question of the merits and defects of the two methods, it must be pointed out that both tests are based on unproved assumption; therefore the validity of the results which they yield can be judged only by correlation with clinical observation. The immediate question to be considered is whether the decrease in prothrombin observed by my method is real or apparent.

Several factors can cause a prolonging of the "prothrombin time": (1) alteration of the fibrinogen, (2) formation of anticoagulants and (3) changes in the prothrombin itself. To ascertain whether the first or second factor is the basic cause of the prolonged coagulation time it is merely necessary to determine the clotting time obtained when a standard thrombin solution is added to plasma. By my adaptation⁴ of Eagle's method, a potent solution of thrombin can be readily prepared.

From the Department of Pharmacology, Marquette University School of Medicine.

1. Rhoads, J. E., and Panzer, J. M.: The Prothrombin Time of "Bank Blood," *J. A. M. A.* **112**: 309 (Jan. 28) 1939.
2. Lord, J. W., and Pastore, J. B.: Plasma Prothrombin Content of Bank Blood, *J. A. M. A.* **113**: 2231 (Dec. 16) 1939.
3. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: A Quantitative Study on Blood Clotting: Prothrombinic Fluctuations Under Experimental Conditions, *Am. J. Physiol.* **114**: 667 (Feb.) 1934.
4. Quick, A. J.: On the Action of Heparin and Its Preparation with Thromboplastin, *Am. J. Physiol.* **115**: 317 (April) 1936.

The results recorded in table 1 indicate that thrombin produces coagulation nearly as effectively in old as in fresh plasma. It can be concluded therefore that neither is the fibrinogen appreciably altered in activity nor is a significant amount of antithrombin or anticoagulant formed during the first forty-eight hours. In older bloods, nevertheless, it is quite likely that changes may occur which will interfere with the accurate quantitative determination of prothrombin.

It seems fairly certain that the delayed prothrombin time is primarily the result of changes in the prothrombin itself. The simplest explanation is that a quantitative decrease in the prothrombin occurs.

Before interpreting the results obtained by my method, it is desirable to restate the principle on which the test is based. The clotting time of recalcified oxalated plasma when mixed with an excess of thromboplastin and a fixed amount of calcium is a quantitative measure of the prothrombin concentration. The values of the clotting time in terms of prothrombin concentration are given in table 2. If the clotting time of a specimen of plasma is fifteen seconds, the prothrombin concentration is 50 per cent according to this method. If such a plasma is diluted with an equal volume of physiologic solution of sodium chloride it will have a prothrombin content of 25 per cent and should clot in twenty-one seconds. The data in table 3 were obtained by determining the clotting time of undiluted and diluted plasma. The fairly good agreement between the expected and the observed clotting times of diluted plasma is evidence in favor of the conclusion that a true decrease of prothrombin occurs.

Another simple means of verifying whether the prolonged "prothrombin time" is due to a quantitative reduction of pro-

demonstrates the labile nature of this substance. It has recently been observed in my laboratory that the prothrombin of goose blood which is carefully collected and kept in a paraffined container remains unchanged for several days, whereas in oxalated goose blood the prothrombin decreases even more rapidly than in human blood. It appears that the removal of calcium

TABLE 3.—Data Obtained by Determining the Clotting Time of Undiluted and Diluted Plasma

Age of Plasma, Hours	Clotting Time of Undiluted Plasma, Seconds	Concentration of Prothrombin (from Table 2), per Cent	Clotting Time of Diluted Plasma,* Seconds	Concentration of Prothrombin (from Table 2), per Cent
1	12	100	15	50
24	15	50	21	25
24	14	58	18	35
24	14	58	19	30
24	16	45	21	25
48	18	35	27	17
48	17	40	24	21

* Plasma diluted with an equal volume of physiologic solution of sodium chloride.

TABLE 4.—Results of a Typical Experiment

	Prothrombin Time (Quick), Seconds	Concentration of Prothrombin	
		From Table 2, per Cent	Calculated,* per Cent
Stored plasma (72 hours old).....	21-22	25	
Fresh plasma.....	11½	100	
Stored plasma, 1 part {	14	58	62½
Fresh plasma, 1 part {			
Stored plasma, 9 parts {	18	35	32½
Fresh plasma, 1 part {			

* On the basis that stored plasma contained 25 per cent and fresh plasma 100 per cent of prothrombin.

somehow decreases the stability of the prothrombin molecule. Further study may perhaps lead to the evolving of a method for preserving blood without loss of prothrombin.

At present it seems wise to depend exclusively on fresh blood for controlling bleeding in the jaundiced patient. Such cases present an emergency which requires prompt and effective treatment. The bleeding can be controlled by giving fresh citrated blood, as I as well as others have demonstrated. Interestingly, in the case which I⁵ described the prothrombin before one transfusion of 550 cc. of blood was 8 per cent of normal and 20 per cent immediately after the blood was given. The amount of blood injected was sufficient to elevate the prothrombin just above the hemorrhagic level. Had the patient been given stored blood with a prothrombin content of 50 per cent, the calculated prothrombin rise would have been approximately 6 per cent, or an elevation to only 14 instead of 20 per cent. Obviously such a transfusion would not have profited the patient.

With the proper treatment of the jaundiced patient preoperatively by the administration of vitamin K and bile salts and by the recognized methods for increasing hepatic function, bleeding is now rarely encountered. If hemorrhage does occur, the surgeon is not justified to gamble by giving stored blood unless fresh blood is not obtainable.

SUMMARY

Evidence indicates that the prothrombin of decalcified blood diminishes on standing and supports the conclusion of Rhoads and Panzer that stored blood is inferior to fresh blood for controlling bleeding in jaundice.

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5. Quick, A. J.: The Nature of the Bleeding in Jaundice, J. A. M. A. 110: 1658 (May 14) 1938.

TABLE 1.—The Clotting Time of Fresh and Preserved Plasma by Thrombin

Concentration of thrombin +..	Clotting Time in Seconds *			
	1	1/5	1/10	1/20
Fresh plasma I.....	3	7	11-12	18
Fresh plasma II.....	3	7	11-12	17
Plasma 48 hours old I.....	3	7-8	11½-12½	18-19
Plasma 48 hours old II.....	3	8	12-12½	19-20

* The clotting time was determined by mixing 0.2 cc. of plasma with 0.1 cc. of the thrombin solution.

† Dilutions of thrombin were made with distilled water.

TABLE 2.—Values of the Clotting Time in Terms of Prothrombin Concentration

Prothrombin Concentration, per Cent	Clotting Time,* Seconds
100	11-12
80	12½
60	13½
50	15
40	17
30	19
25	21½
20	25
10	35
5	65

* Plasma 0.1 cc. mixed with thromboplastin solution 0.1 cc. and 0.025 molar calcium chloride 0.1 cc.

thrombin is to mix stored plasma with varying proportions of fresh plasma and then determine the coagulation times of the mixtures. If a true reduction of prothrombin exists, the clotting times of the mixtures should correspond to the calculated concentrations of prothrombin. A typical experiment is recorded in table 4. The agreement between the observed and the calculated values of prothrombin furnishes further proof that the decrease of prothrombin in stored blood is real.

It is not surprising that a reduction of prothrombin should occur in preserved blood. The fact that heating plasma to 56 C. will destroy most of the prothrombin in fifteen minutes

PULMONARY EMBOLISM FOLLOWING THE INJECTION
TREATMENT OF VARICOSE VEINS

G. O. DEAN, M.D., AND J. W. DULIN, M.D., IOWA CITY

Numerous authors report a low incidence of serious complications following the injection therapy of varicose veins. McPheeters¹ has reported seven deaths in a series of 53,000 cases. Four of these were due to embolism. Silverman² collected nineteen cases of embolism from the literature and added one case of his own. In his series there were fifteen deaths and five recoveries. Kettel³ reported ten deaths due to embolism in a series of 60,000 cases. Westerborn⁴ has recently reported eleven deaths from embolism in a series of 30,000 cases; he also mentions fifty-three additional cases of embolism. Probst⁵ reported two cases of anaphylaxis and three of embolism with no deaths. Kilbourne⁶ collected a series of twenty deaths due to emboli and other causes. An occasional death from allergy has been reported.⁷

We believe that embolism is the most common cause of death following the injection treatment of varicose veins. Its occurrence is one of the most dreaded catastrophes in surgery. The patient who has felt well suddenly complains of severe pain in the chest, air hunger and the fear of impending death. Respirations are rapid and shallow. Pallor or cyanosis with engorgement of the superficial veins of the neck soon appears. The pulse is rapid and thready. Death may ensue in a few minutes. Most emboli develop from six to ten days after the injection. There are on record, however, three cases in which embolism occurred within a few minutes after the veins were injected.⁸

The etiologic factors in embolus formation include bed rest and infection. It is probable that continuous bed rest predisposes to most of the emboli, the danger of bed rest being that it favors the development of venous stasis and a resultant thrombophlebitis from which most emboli are thought to arise. The role of infection in embolism has been pointed out by de Takats.⁹ Kilbourne⁶ emphasizes the necessity of employing a sterile technic for the injections. He also believes that bactericidal solutions should be used and points out that eleven of the twenty patients with embolism in his series were injected with nonbactericidal solutions. Westerborn,⁴ on the other hand, shows that in some cases emboli develop when bactericidal solutions are used. Sodium morrhuate and most of the other fatty acid preparations in use today are only weakly bactericidal. Occasionally an embolus will develop even though the patient has remained ambulatory after the injections and in spite of the fact that no evidence of phlebitis exists,¹⁰ indicating that there are other etiologic factors than bed rest and infection. Silverman² believes that the use of a large volume of sclerosing solution is the cause of most emboli.

REPORT OF TWO CASES

A recent survey of the last 600 cases of varicose veins treated at the University Hospitals revealed that two deaths had resulted from embolism after injection therapy:

CASE 1.—A white woman aged 68 was admitted to the University Hospitals for treatment of large varicose veins which had been present in both lower extremities for twenty years.

From the Department of General Surgery, State University of Iowa College of Medicine.

1. McPheeters, H. O., and Rice, C. O.: *Varicose Veins: Complications, Direct and Associated, Following the Injection Treatment: A Review of the Literature*, J. A. M. A. 91: 1090-1094 (Oct. 13) 1928.

2. Silverman, Isidore: *The Incidence of Embolism in Treatment of Varicose Veins with Sclerosing Solutions: Report of a Fatality*, J. A. M. A. 97: 177-178 (July 18) 1931.

3. Kettel, Karsten: *Fatalities Following Injection Treatment of Varices. Etiology and Pathogenesis of Emboli*, Zentrbl. f. Chir. 58: 1498-1510 (June 13) 1931.

4. Westerborn, A.: *Ueber die Emboliegefahr bei Injektionsbehandlung von Varizen nebst einem Bericht über die in Schweden vorgekommenen Emboliefälle*, Acta chir. Scandinav. 70: 321-358, 1937.

5. Probst, J. G.: *Major Complications of Intravenous Therapy of Varicose Veins*, J. Missouri M. A. 33: 349-352 (Sept.) 1936.

6. Kilbourne, N. J.: *Elimination of Certain Dangers in the Treatment of Varicose Veins*, Am. J. Surg. 25: 148-154 (July) 1934.

7. Shelley, H. J.: *Allergic Manifestation with Injection Treatment of Varicose Veins: Death Following an Injection of Monethanamine Oleate (Monolate)*, J. A. M. A. 112: 1792-1794 (May 6) 1939.

8. Horn, O., and Foged, J.: *Risk of Embolism in the Injection Treatment of Varices, Clinical and Experimental Study*, Mitt. a. d. Grenzgeb. d. Med. u. Chir. 42: 409, 1931. Kettel.³

9. de Takats, Geza: *Thrombosis and Thrombophlebitis in Christopher*, 9. de Takats, editor: *A Textbook of Surgery*, ed. 2, Philadelphia, W. B. Saunders Company, 1939.

10. McPheeters and Rice.¹ Silverman.² Kettel.³ Westerborn.⁴

She gave no history suggestive of past or recent thrombophlebitis. She was moderately asthenic but her general health was good. Physical examination revealed a mild degree of arteriosclerotic heart disease. The blood pressure was 125 systolic, 80 diastolic. A dry shallow ulcer approximately 2 by 3 inches (5 by 7.5 cm.) in diameter was present on the lower medial aspect of each leg. The urine and blood studies including blood sugar and Wassermann tests were not remarkable.

On the day of admission the varicosities at three sites on the left extremity and two sites on the right extremity were injected with a solution of 50 per cent dextrose and 20 per cent sodium chloride. The amount of solution for each injection varied from 25 to 35 cc.

Two days later a red, swollen, indurated area was noticed on the left thigh at the site of the uppermost injection. The temperature was 102 F. The patient was therefore put to bed and ice packs were applied locally. Eight days later an abscess in this region was drained and hot wet dressings were applied. Her condition improved rapidly and the temperature returned to normal within twelve hours.

Fourteen days after the injection the patient suddenly had marked shortness of breath and a mild anterior thoracic pain which did not radiate. She rapidly went into shock, the blood pressure falling to 90 systolic, 70 diastolic, and the pulse rate rising to 150 a minute. Epinephrine and caffeine with sodium benzoate were administered subcutaneously. Three hours later the patient was greatly improved, the pain and dyspnea were less marked and the pulse rate was 100 a minute. However, she remained pale, weak and very nervous. Morphine was given for rest, and digitalis was started.

Two days after this episode the pulse rate was 90 a minute with a regular rhythm, and the blood pressure was 130 systolic, 80 diastolic. The temperature had begun to climb, however, and a diagnosis of bronchopneumonia was made.

Twenty days after the injections were made another episode of dyspnea, tachycardia and shock developed similar to the previous attack. From that time on the patient's course was retrograde and she died the next night.

Although a postmortem examination was not made, the clinical picture was one of pulmonary emboli with subsequent bronchopneumonia.

CASE 2.—A white woman aged 54, weighing 311 pounds (141 Kg.), was admitted to the University Hospitals for treatment of varicose veins, which had been present in the left leg for thirty-five years. She also complained of shortness of breath on exertion, but the physical examination of the heart and lungs was not remarkable. The blood pressure was 143 systolic, 96 diastolic. The left leg presented two masses of varicosities and a deep ulcer 4 cm. in diameter above the medial malleolus. The urine and blood studies including the Wassermann reaction of the blood were within normal limits.

On the day of admission one varicose vein on the left leg was injected with 3 cc. of a 5 per cent solution of sodium morrhuate. On the following day some inflammatory reaction was noticed in and about the ulcer. The patient was kept in bed and dry heat was applied to the legs. An obesity diet was also maintained. During the next nine days her course was uneventful except for slight pain in the left leg in the region of the varicosities.

On the tenth day after injection the patient was feeling well. She arose to be weighed and suffered a fainting spell, followed by severe pain in the chest associated with marked air hunger, cyanosis and a rapid pulse rate. Despite supportive measures she became worse, moist rales developed in both lung bases and she died thirty-one hours after the first untoward symptom.

At autopsy the pulmonary artery contained a large laminated antemortem thrombus. The lungs were congested and partly collapsed. The varicose veins above the ulcer showed an organizing thrombus. The heart was grossly normal.

COMMENT

Our experience in these two fatal cases of pulmonary embolism, occurring in a relatively small series of cases, leads us to believe that the dangers of this procedure are greater than is usually reported. A critical analysis of these cases reveals several common conditions. In neither case was the injection treated

a high saphenous ligation, a procedure which we now perform almost as a routine.¹¹ We have had no case of pulmonary embolus occurring after high saphenous ligation. Neither patient was kept ambulatory following the injections. The first patient was placed on complete bed rest because of a suppurative process, while the second was kept in bed because definite cardiac disturbance had to be ruled out. The latter patient complained of shortness of breath, which was unquestionably due to her obesity. Frank infection was present in the one. In the other pain and discomfort were present for several days following the injection, which suggests that some degree of inflammation was present. Chronic leg ulcers were present in both cases.

CONCLUSIONS

The available evidence indicates that certain precautions should be observed with the injection of varicose veins in order to avoid the development of pulmonary emboli:

1. A high saphenous ligation or other indicated surgical procedure should be performed before injection therapy.
2. The patient should be kept ambulatory after the injections.
3. Injecting of inflamed veins should be avoided.
4. A sterile technic should be carried out for the injections.
5. Sterile solutions should be used for the injections.
6. Small amounts of the sclerosing solution should be used.

PNEUMO-ENCEPHALOGRAPHIC AND ELECTRO-ENCEPHALOGRAPHIC LOCALIZATION OF AN EPILEPTOGENIC FOCUS

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JUDAH MARMOR, M.D., NEW YORK

AND

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A case illustrating successful localization of an epileptogenic focus by pneumo-encephalogram is presented together with a confirmatory localization by electro-encephalogram. Conclusions were derived from the latter procedure independently of the clinical and pneumo-encephalographic observations.



Fig. 1.—Large pocket of air in frontal region revealed by pneumo-encephalography.

REPORT OF CASE

A white man aged 30, unmarried, was admitted to the Montefiore Hospital for Chronic Diseases on Sept. 11, 1938, with the complaint of epileptic seizures of four months' duration. Eight years before he had been thrown from a rapidly moving truck, sustaining a basilar skull fracture from which he made

11. Dean, G. O., and Dulin, J. W.: Treatment of Varicose Veins. *Arch. Surg.* 39:711-719 (Nov.) 1939.

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a slow but complete recovery. In April 1937 he was stated to have dislocated his right shoulder during sleep wherein he was heard to make "funny noises." Reduction of the dislocation was successfully carried out the following day; since that time the patient had frequently dislocated the same shoulder, learning to reduce it himself. His health was otherwise unimpaired until May 15, 1938, when he had an epileptic seizure during

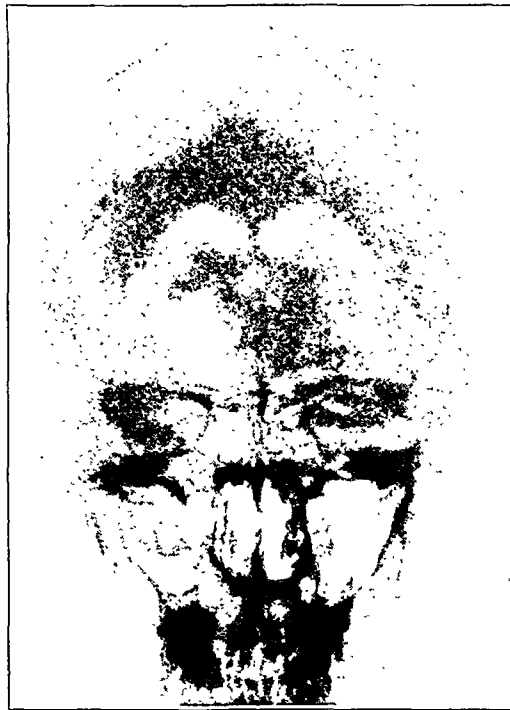


Fig. 2.—Large pocket of air in the left frontal region revealed by pneumo-encephalography.

his sleep. This was witnessed by his mother, who described tonic and then clonic phases with tongue biting and incontinence but no laterality of convulsive movements. However, the patient noted that there were slight weakness of the right upper extremity for two or three days afterward and a tendency to stumble. Between that date and July 3 there were six such seizures with similar pattern. His past history included a brief period of unconsciousness in his youth after being struck on the head by a stone. A paternal uncle was said to have died during an epileptic seizure. The patient's mother and brother were described as "nervous and high strung."

The patient was tall, thin and well developed. He showed marked dermatographia, ready flushing of the skin and chronic otitis media on the left. The blood pressure was 120 systolic, 95 diastolic. The neurologic examination revealed a diminished right arm swing on walking and reversal of the normal hearing formula in the left ear. Hyperventilation and carotid sinus pressure produced no effect. Examination of the blood, urine and spinal fluid revealed no abnormalities. The basal metabolic rate, visual fields and x-ray appearance of the skull were all within normal limits. A pneumo-encephalogram made on October 10 revealed a large pocket of air in the left frontal region just behind the frontal sinus, irregular in outline and measuring about 4 by 4 cm. It did not appear to communicate with the ventricle. The third and lateral ventricles appeared somewhat dilated (figs. 1 and 2).

Electro-encephalographic studies were performed without any knowledge of the history, clinical or pneumo-encephalographic features. The report follows:

Bipolar Study.—Fronto-occipital region: right, normal; left, alpha waves less frequent than normal and broken up by large numbers of beta waves; occasional delta waves.

Unipolar Study.—(a) Frontal region: right, normal; left, few alpha waves, many beta waves, fairly frequent delta waves with occasional spike forms. (b) Parietal and occipital regions:

right, normal; left, similar to frontal but becoming less abnormal as the occipital zone is approached.

The impression was that there was an epileptogenic focus in the left frontal lobe involving the cortex. The paucity of delta waves was somewhat against an expanding lesion.

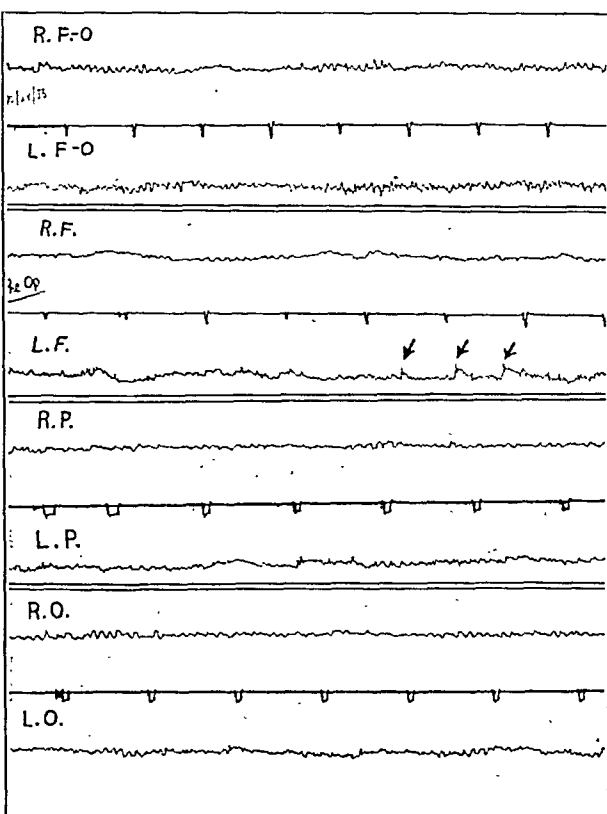


Fig. 3.—Preoperative electro-encephalogram: In figures 3 and 4 F-O indicates bipolar fronto-occipital leads; F, unipolar frontal leads; P, unipolar parietal leads; O, unipolar occipital leads. The arrows point to the sporadic spike formations in the left frontal leads (L. F.).

The patient had two more epileptic seizures early in November and was then subjected to a left frontal craniotomy with the area under procaine hydrochloride anesthesia. At the extreme left frontal pole a large cyst was encountered the wall of which was made up of a thin layer of cortex less than 1 cm. in thickness. A partial excision of this region was made, after which the patient had a stormy postoperative course characterized by clouding of consciousness and some aphasia. Within two weeks the condition cleared up entirely and he left the hospital with no demonstrable neurologic signs or subjective complaints.

An electro-encephalogram made four weeks after operation (fig. 4) was reported as follows: No abnormal wave productions were noted on either side of the brain in any of the standard leads. There were no spike formations and no delta waves. The alpha wave production, however, was poorer on the left than on the right, especially in the left frontal lead. The records at this time showed no evidence of any epileptogenic focus and provided a striking contrast to the records taken preoperatively. The poor alpha wave production in the left frontal area was explicable on the basis of the removal of a large section of cortical tissue from that area.

To date the patient has had no further seizures.

COMMENT

This case is of interest from several aspects: the paucity of objective neurologic abnormalities on clinical examination must be emphasized. Except for the diminished right arm swing, which many observers were inclined to attribute to joint changes associated with the chronically dislocated shoulder, results of clinical neurologic examination were entirely negative. The accurate correlation between the observations obtained

by electro-encephalography and by pneumo-encephalography is a further point of interest in this case. It should be noted that as yet electro-encephalography is not capable of distinguishing different types of focal pathologic conditions, although the impression in this instance, because of the paucity of delta waves, was that we were not dealing with an expanding lesion. However, the method is capable of clearly indicating and localizing the presence of a focal cortical pathologic change, which makes it a valuable adjunct to the neurodiagnostic armamentarium. It is particularly valuable in a case like the present one, in which the clinical data are meager and the question of differentiating between an idiopathic and a focal epileptic disorder arises. It has the advantage over pneumo-encephalography of being simple to perform and entirely harmless, and the great advantage to the patient of being free from any discomfort or risk. We feel that in selected cases and with growing experience in this still young technic it may well become the method of choice over pneumo-encephalography, the latter technic being retained as a method of last resort when the combined clinical and electro-encephalographic observations still leave the diagnosis in doubt.

SUMMARY

Post-traumatic epilepsy came on eight years after skull fracture. There were no localizing signs on examination. The only clue obtainable was a history of slight weakness in the right upper extremity following the seizures. A pneumo-encephalogram revealed a large cystic area in the left frontal region of the brain. Electro-encephalographic studies independently performed pointed to an epileptogenic focus in the same area, which was interpreted as probably not an expanding lesion. Craniotomy revealed a large intracerebral cyst, part of

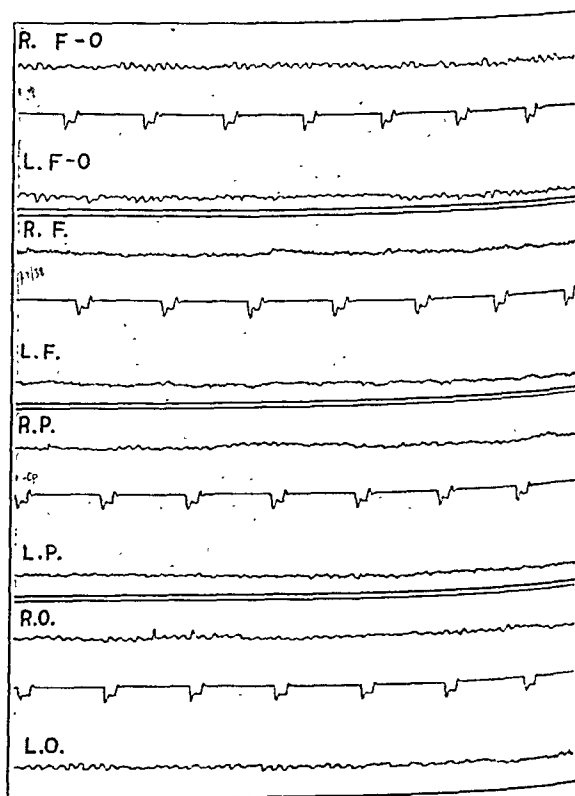


Fig. 4.—Postoperative electro-encephalogram: In the left frontal lead note the absence of the spike formations and the relatively flat curve as compared with the corresponding preoperative lead.

which was excised; subsequently an electro-encephalogram showed disappearance of the epileptogenic focus. No further seizures have occurred to date.

NOTE.—Since this paper was written the patient has had two major convulsions, but it has not been possible to make further electro-encephalographic studies for technical reasons.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE DRUG THERAPY OF EPILEPSY

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BOSTON

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—Ed.

Traditionally the attitude toward the treatment of epilepsy is one of defeatism. By definition, epilepsy is a hopeless disease; why, therefore, waste time and attention on it? Because much of the current medical opinion about the nature of epilepsy is out of date, a few paragraphs must be spent in orientation. The intelligent use of drugs in the treatment of epilepsy necessitates an understanding of the underlying cause or causes of this disorder.

WHAT EPILEPSY IS

Briefly, epilepsy is a symptom of a disturbance in the electrochemical activity of the discharging cells of the brain: it is a paroxysmal cerebral dysrhythmia.¹ In epilepsy the dysrhythmia of the brain is analogous to those disordered rhythms of the heart which interfere with cardiac function. The patterns of electrical rhythm seen in a normal person and in epileptic patients during the three principal types of seizures are shown in the accompanying electro-encephalographic tracings.

WHAT CAUSES ABNORMAL RHYTHMS

The dysrhythmia of the brain is, I believe, due to a peculiar chemical or physicochemical constitution of neuronal cells which causes various cell clusters to discharge at a rate and with a voltage which is both abnormal and functionally devastating. The details of what must be an inscrutably intricate and minute chemical process in brain cells are of course not known. However, the underlying causes of their abnormal discharge can be separated into two types: There is, first, the constitutional or hereditary makeup or reaction of the discharging nerve cells—a quality fundamental and fixed. Second, there are abnormalities of the body or of the rest of the brain which act on the inner mechanism of the cells and accentuate the tendency to an abnormal discharge—factors precipitating and variable.

To use a homely illustration, a bonfire requires both combustible material and a lighted match. Though probably both constitutional and environmental factors are present in all who have epilepsy, their relative importance varies in different individuals. The acquired abnormalities which activate the inherent predisposition to seizures are multiple and variable.² Consequently, the greater portion of therapy must be individual, tailor made for the given patient. It is the main business of

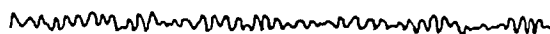
the physician to find and if possible to remove the various causes, both fundamental and precipitating, that may be found.

GENERAL TREATMENT

The portion of epilepsy which is due to heredity can in time be corrected by eugenics, since a laboratory method of determining the predisposition to seizures and allied disorders in healthy persons is now available.³ The bodily disorders that help to produce seizures must each receive its own appropriate therapy. Brain tumors, meningeal scars, endocrine disorders, emotional disturbances, toxic conditions, inadequate physique and poor regimen must be treated individually. Such therapy should be the principal concern of the conscientious physician. The most dramatic relief from seizures that I have seen was obtained by patients who never took medicine for them.

In the United States there are five or six patients for every physician, too large a number to be treated by specialists. The family physician is most strategically placed to treat patients with seizures if he possesses or will acquire the required interest, hope and knowledge. The patient needs protection from physical and mental sequelae of repeated seizures or from psychologic or personality dislocations arising from the hostile attitude of society. Of the many handicaps that may face the epileptic, a defeatist attitude of the doctor to whom they go for advice and encouragement is most inex-

NORMAL



GRAND MAL

PETIT MAL

PSYCHOMOTOR



Types of cerebral dysrhythmia found in three types of seizures. The upper line is the tracing of a normal person, the waves occurring at the rate of 8 or 10 a second. In the lower line the fast spiky waves at the left were recorded during a grand mal seizure, the wave and spike pattern in the middle during a petit mal seizure, and the slow waves at the right during a psychic variant (psychomotor) seizure.

cusable. The majority of persons with epilepsy can be either relieved of their symptoms or helped to live a useful life in spite of them. These fundamental and individual needs attended to, and not till then, the physician is free to consider medication.

THE DRUG THAT WILL CURE

The drug that can be spoken of as a specific for epilepsy (paroxysmal cerebral dysrhythmia), when and if it is found, will stabilize the rate at which the neurons of the brain discharge. In the cerebral dysrhythmias of epilepsy the waves of electrical activity are at times either too fast or too slow. Presumably a drug that effectively slows an abnormally fast rhythm will make a patient whose rhythm is already too slow worse. To complicate matters, most patients display a rhythm which is at one time too fast and at another time too slow. The ideal antiepileptic drug will be one which prevents the initiation of rates that are either abnormally fast or abnormally slow. This sounds utopian, but the electrical discharge of neurons is conditioned by their physicochemical state, and it is already known that various procedures and medicines modify both the elec-

From the Neurological Unit, Boston City Hospital, and the Department of Neurology, Harvard Medical School.

1. Gibbs, F. A.; Gibbs, Erna L., and Lennox, W. G.: *Epilepsy: A Paroxysmal Cerebral Dysrhythmia*, *Brain* 60: 377 (Dec.) 1937.

2. Lennox, W. G.: *Epilepsy: Multiple Causes of Seizures in Individual Epileptic Patient*, *New England J. Med.* 209: 386 (Aug. 24) 1933.

3. Lennox, W. G.; Gibbs, Erna L., and Gibbs, F. A.: *The Inheritance of Epilepsy as Revealed by the Electro-Encephalograph*, *J. A. M. A.* 113: 1002 (Sept. 9) 1939.

ical waves of the brain and the tendency to seizures.⁴ uricular fibrillation has its quinidine, and research could be able to discover new medicines that will control the dysrhythmias of epilepsy better than drugs in use at present. Though this subject is tempting and stimulating, the present discussion of therapeutics must deal with drugs the value of which has been proved empirically.

HISTORY OF DRUG THERAPY

Until eighty years ago discussions of drug therapy of epilepsy included lists both long and bizarre. For example, the prescriptions of Thomas Willis,⁵ professor of physic at Oxford and perhaps the most fruitful contributor to the knowledge of epilepsy in the seventeenth century, included such ingredients as powdered human skull, elk's claw, liver of wolf, gall of a boar mixed with urine, and stones of swallows. Writing in 1854, Delasiauve discusses fifty-two medicines then in use. At present our attention can be centered on three agents—bromides, barbiturates and hydantoins.

Potassium bromide, discovered in 1826, was introduced into the British Pharmacopeia in 1835 (for the treatment of splenomegaly) and removed in 1851,⁶ though Sir Charles Locock is credited with first using bromides in epilepsy, he apparently never made written communication on the subject. While discussing a paper by Sieveking in 1857⁷ he mentioned that, after reading of a German who noted his own impotence when taking bromides, he (Locock) gave the drug to fourteen or fifteen female patients whose seizures were hysterical or related to the menses. All of them were benefited. Six or seven years was required for the use of the drug to become general, but for fifty years it held undisputed first place in the treatment of seizures. Gowers⁸ states that in the year 1899 the National Hospital at Queen Square, London, dispensed almost 2 tons of bromide.

Phenobarbital was synthesized in 1903,⁹ but its use in epilepsy was first reported by Hauptmann⁹ in 1912. He states that favorable results were obtained but does not give the number of cases, and the only data presented are in an unlabeled chart showing a reduction in the monthly number of seizures of one patient. Other German articles followed quickly, but the coming of the war prevented distribution of the drug and the first report from America was by Grinker¹⁰ in 1920. In this country phenobarbital was adopted as the official drug, though it is still sold under the name luminal (or gardenal) in Europe and under the proprietary name Luminal in the United States.

In 1936 Putnam, refusing to believe that knowledge had died with Locock and Hauptmann, began the systematic evaluation of scores of drugs as anticonvulsants in animals. Putnam and Merritt¹¹ in 1937 reported that sodium diphenyl hydantoinate (dilantin sodium) is superior to either bromides or phenobarbital in preventing convulsions electrically induced in cats, a result which they later confirmed on patients.

GENERAL PRINCIPLES

1. The physician is to treat the patient, not just one of the patient's symptoms. If he stops convulsions but in doing so makes the patient stupid and an outcast, he fails.

2. The physician is to prevent the whole seizure and not just the involuntary muscular movement—the convulsion. Disturbances of consciousness, of the sympathetic and parasympathetic nervous systems, of sensation and of the psyche are part and parcel of a convulsive seizure, or they may make up a seizure which is nonconvulsive. More than two thirds of all seizures consist simply of loss of consciousness with insignificant involuntary muscular movements (petit mal) or else of psychic disorders (epileptic equivalents). The bromides and phenobarbital are of uncertain value for petit mal, or in large doses they may actually make psychic seizures worse. Overdosage with the bromides or phenobarbital may produce symptoms which resemble the mental or behavior characteristics of psychic epilepsy. Overdosage also slows the electrical waves of the brain, which in psychic epilepsy already are abnormally slow.¹² The unwary physician may be fighting fire with gasoline if he tries to stop all symptoms by means of sedative drugs.

3. The influence of drugs varies not only for different types of seizures but also for the same type of seizure in different patients. Because Sally Jones's convulsions are helped by bromide or phenobarbital is no proof that Sam Brown will benefit. The use of an anti-epileptic drug is for each patient a fresh experiment. The object of the experiment is to find whether the drug helps him. No answer is possible unless there has been a control period when no drug or a smaller amount of the drug was taken. Seizures are notorious for the irregularity of their appearance. Natural remissions, which may come without apparent reason and last for years, are an encouragement to patients but may fill the coffers of "patent medicine" concerns and make ridiculous many of the reports of reputable but uncritical writers. Hence the need for conservative appraisal of the results of medication. Paré's modest declaration "I dress the wound, God heals it" is as good for seizures as for surgery.

4. Medication should be continued only if thorough trial demonstrates its effectiveness in controlling or ameliorating seizures in this particular case. The matter of seizures aside, other effects of sedative drugs are undesirable. Physicians should have the hardihood in the face of general custom not to continue the use of a sedative drug if the patient is not benefited by it. Of course the trial, to be conclusive, must be of sufficient length, and even as little as a 10 or 20 per cent reduction in the number of seizures is worth while. Furthermore, though attacks continue unabated, trial may demonstrate that without medication they would be yet more frequent or severe.

ADMINISTRATION

Because seizures are usually uncertain in the time of their occurrence, the concentration of the drug in the body should be maintained at a constant level; hence it must be taken daily. Only those occasional patients whose seizures occur periodically (as during the menses) or at a fixed time in the twenty-four hours can concentrate medication in the period immediately

4. Gibbs, F. A.; Gibbs, Erna L., and Lennox, W. G.: Cerebral Rhythms of Epilepsy: Measures for Their Control, *Arch. Neurol. & Psychiat.* **39**: 298 (Feb.) 1938.

5. Willis, Thomas: *Practice of Physick*, London, 1684.

6. Gowers, William R.: *Epilepsy and Other Chronic Convulsive Disorders*, London, J. & A. Churchill, 1901.

7. Sieveking, E.: Analysis of Fifty-Two Cases of Epilepsy Observed by the Author, *Lancet* **1**: 527 (May) 1857.

8. Fischer, E., and von Mering, J.: Ueber eine neue Klasse von bläufarbigem, *Therap. d. Gegenw.* **5**: 97, 1903.

9. Hauptmann, A.: Luminal bei Epilepsie, *München. med. Wchnschr.* **1907**, 1912.

10. Grinker, Julius: Experiences with Luminal in Epilepsy, *J. A. M. A.* **75**: 588 (Aug. 28) 1920.

11. Putnam, T. J., and Merritt, H. H.: Experimental Determination of Anticonvulsant Properties of Some Phenyl Derivatives, *Science* **85**: 523 (May 28) 1937.

12. Lennox, W. G.; Gibbs, F. A., and Gibbs, Erna L.: Effect of Electro-Encephalogram of Drugs and Conditions Which Influence Seizures, *Arch. Neurol. & Psychiat.* **36**: 1236 (Dec.) 1936.

preceding the expected seizure. In the future, prediction of convulsions may be possible by means of daily electro-encephalographic readings.¹ Patients who have only nocturnal seizures are generally advised to take all their medicine at bedtime. However, the possibility of driving seizures into the undesirable daytime period must be considered.

Maintenance of a constant level of bromide and phenobarbital in the tissues is possible because these drugs disappear from the body slowly. The bromides, though present in all body secretions, are eliminated mainly in the urine. After a single dose about 10 per cent will disappear in the first twenty-four hours, but traces may be found in the urine for months. In contrast, about four fifths of the phenobarbital is said to be oxidized in the tissues and only about one fifth is eliminated in the urine. Dilantin sodium apparently disappears from the tissues fairly promptly. The amount of drug ingested should, after an interval, balance the amount destroyed or eliminated. Frequent doses throughout the day are not desirable because they bring the patient's condition to his attention. Once a day is sufficient for phenobarbital but, because of the possible gastric irritation from large single doses, the bromides and dilantin sodium are best given three times a day.

Anticonvulsant drugs often seem to act as a dam which prevents seizures for a time but allows them to come out with unusual volume when the drug is abruptly discontinued. In other words, these drugs may act by raising the seizure threshold rather than through any specific correction of the abnormal seizure mechanism. They may prevent seizures but not influence dysrhythmias. Medication should not be discontinued abruptly. In the case of the bromides, the slow excretion cushions the withdrawal. The absence of an increase of seizures after withdrawal probably means that the drug was without effect. The beneficial effect of anticonvulsant drugs often "wears off." In this event, after a rest the patient may be able to resume medication with hope of a repetition of the initial benefit. Pregnancy need not interrupt medication. The bromides are secreted in the milk of the mother.

The aim of medication is to give an amount which will control symptoms without interfering with the normal activity of the individual. It is better for patients to have occasional attacks than to be free of attacks and yet so drugged that they are but half alive. The optimum amount for each patient must be determined by experimentation. Dosage is more variable for phenobarbital and dilantin sodium than for bromides, possibly because of individual differences in susceptibility or in the rate of oxidation. For accurate results, the physician should keep a calendar of his patient's seizures (the one devised by Wheeler¹³ is very good). Starting with a moderate dose, if seizures continue, the physician should step up the amount of the drug at intervals until an increase does not result in a decrease of seizures, or until symptoms of intoxication appear or a certain maximum is reached.

How long should medication be continued after seizures have ceased? Those who advise continuance for life give more credit to the drug than to natural healing forces in the body. The symptoms of epilepsy cannot be spoken of as cured but only arrested. After one or two years of freedom the dose may be reduced

and several months later omitted. The physician must be guarded in his prognosis, because seizures may return after many years of freedom. Furthermore, the patient's clinical record may be good but his electrical record bad. His bodily seizures may be separated by years but his brain dysrhythmias by minutes. Just as a syphilitic patient now receives active treatment if he is symptom free but has a positive Wassermann reaction, the epileptic patient may receive treatment based on the type and degree of abnormality of his electro-encephalogram.

A stumbling block in the minds of some patients, especially in the case of those using barbitol and its derivatives, is the possibility of "getting the drug habit." None of the three drugs under discussion are habit forming in the sense in which morphine is. The dependence is more psychologic than physiologic, at least in the usual epileptic person, who is not psychoneurotic. He may fear to give up his drug, but in my experience he has no withdrawal symptoms when he does so. Alert patients dislike sedatives because in effective doses they are likely to produce morning "hangovers," but unlike the other two drugs dilantin sodium does not have a sedative effect.

PHARMACOLOGY

In the intelligent use of these drugs the physician should be familiar not only with the effect on seizures but also with other effects. He would like most to know the essential mechanism by which the drug retards seizures and why it is effective in some cases or in some types of seizures and not effective in others.

Just how the chemical exerts its physiochemical effect on the brain is not known—whether it prevents the abnormal electrical discharge (or its spread) by altering the permeability of the cell membrane, by affecting the electrolyte balance or by the oxidative processes of the cells. After injection of a solution of a bromide into an animal, the greatest concentration of the bromide is found in the cortical and that of phenobarbital in the subcortical areas of the brain; hence the assumption that the action of the two drugs is on these respective areas. But the apparent concentration of bromide in the cortex may simply reflect the high water content of the cortex. The relatively low concentration of bromide in the brain as compared with that in the blood and other tissues is due to the low chloride content of the brain.¹⁴

Though ignorant of the chemical mechanism by which sedatives act, workers are now able to record the effect of drugs on the essential electrical activity of the brain. Sodium or potassium bromide and phenobarbital seem to inhibit the development of the abnormal patterns characteristic of petit mal, or else they break up the abnormal rhythm before it has gone long enough to constitute a clinical seizure.¹² The effect on other types of dysrhythmia needs to be worked out.

The principal pharmacologic features of the three drugs are as follows:

Sodium or Potassium Bromide.—Bromine may be combined with many metals—sodium, potassium, calcium, ammonium, lithium, strontium or zinc—to form the respective bromides. These salts are white, odorless, cubital crystals or a granular powder. They are easily soluble. The bromides are absorbed rapidly

13. Wheeler, Theodora: Graphic Charting Method for Use in Recording Seizures of Patients with Epilepsy, *Arch. Neurol. & Psychiat.* 35: 776 (April) 1936.

14. Boshes, Benjamin: Study of Action of Bromides in Clinical and Experimental Epilepsy, *J. Nerv. & Ment. Dis.* 83: 390 (April) 1936.

when taken by mouth, the effect on seizures being noted within fifteen minutes. A bromide behaves like a chloride, the two electrolytes maintaining a reciprocal relationship. For a steady concentration of bromide in the body the chloride intake should be fairly constant. If the chloride intake is reduced the patient can economize on his dose of bromide, for more of it will be retained. Conversely, an increased sodium chloride intake may increase the elimination of bromides and bring on seizures. If the patient is suffering from bromide intoxication the treatment is infusion of from 100 to 500 cc. of isotonic sodium chloride solution and ingestion of from 12 to 16 Gm. (192 to 256 grains) of sodium chloride in water daily. The process of debromidization may cause exacerbation of symptoms, as the bromide is "pushed" from the tissues to the blood stream and will require two or three weeks for its completion.

In concentrated doses bromides, like any salt, cause irritation of the stomach, dehydration and thirst. With larger doses the pulse, respiratory rate, reflexes and sex impulses are decreased. Four Gm. (60 grains) given in a single dose leads to depression of reflexes and mental calmness amounting to sluggishness and sleep. Excessive administration leads to poor memory, apathy, disturbed speech, ataxia, impotence, anorexia, anemia and emaciation. If persisted in there may follow restlessness, disorientation, paranoid trends, hallucinations and stupor. The physician may confuse this state with the psychic seizures of epilepsy, which have already been emphasized, and by thoughtless medication he may increase symptoms which he is trying to allay.

Effect on Mentality and Skin: The two chief objections to the long continued use of bromides in epilepsy have been the reputed effect on the mentality and that on the skin. The saddest and most baffling aspect of epilepsy is the tendency toward mental retardation. Any treatment which to the slightest extent accelerates the process is to be used circumspectly. Mental failure in epilepsy has no simple explanation but is related to heredity,¹⁵ stigmas of degeneration,¹⁶ the type, frequency and duration of seizures and the extent of brain lesions, as well as to the medical and psychologic treatment given. Many patients maintain a normal intellect in spite of a flood of seizures and sedatives. Yet clinicians have always viewed the influence of bromides on mentality distrustfully. Recently Paskind¹⁷ has summoned a swarm of witnesses against bromide from Eccheverria to Ebaugh and believes that he refutes them by showing that Dr. Hugh Patrick gave fifty-four private patients from 24 to 72 grains (1.6 to 4.6 Gm.) of bromide daily for a year or more and only 5.5 per cent gave evidence of mental deterioration. Because 35 per cent of noninstitutionalized patients are mentally abnormal, it must be concluded either that bromide as used by Patrick is a protection against deterioration or that those who remained in his orbit for more than a year were a highly selected group. I believe that persons who are mentally stable (whether epileptic or normal) can take moderate amounts of bromide with impunity, whereas those epileptic persons who are mentally unstable or have psychic variant seizures would better be given other medication.

The second objection to bromide, the tendency to acneform eruptions, may not seem important but actually is, because a patient whose face is disfigured with marks of bromide eruption has his difficulties of self-consciousness, of inferiority and of social adjustment greatly enhanced. Scrupulous cleanliness and the use of arsenic preparations may somewhat mitigate eruptions.

Preparations: There is no virtue in combining the various salts. The choice lies between sodium and potassium. Crystallized sodium bromide contains 57 per cent bromine and the potassium compound 67 per cent. The former is less bitter. As the sedative effect is due to the bromide ion, the salt used is presumed to be a matter of indifference. However, the ratio of sodium to potassium in nervous tissues is highly influential in the discharge of the nerve impulses. If 4 Gm. (64 grains) of sodium or potassium bromide is taken daily, the sodium would constitute about one fourth the normal average daily intake of sodium, and the potassium about one half the normal intake of potassium. These amounts, since readily excreted, should not influence the existing equilibrium of electrolytes in the blood.

The physician who prescribes bromide (or who must diagnose bromide intoxication from other intoxications) should measure the bromide content of the blood serum. Wuth's¹⁸ method can be used for less exact and Toxopeu's, as modified by Dailey,¹⁹ for more exact quantitative analyses. Unfortunately, bromide relationships are highly erratic. The amount in the blood bears no fixed relationship to the amount ingested, to the amount which enters the brain or to the clinical effect either on seizures or on general symptoms.¹⁴ As low a concentration as 100 mg. per hundred cubic centimeters in the blood will be effective in controlling seizures in some patients, and as high as 300 mg. will be ineffective in others. Symptoms of intoxication are usually present above 150 mg.²⁰ and a concentration of 300 mg. is dangerous. However, few fatalities from bromide intoxication have been reported.

Bromides are most easily and cheaply prescribed as sodium or potassium bromide tablets, 10 grains (0.65 Gm.) each, or a prescription may be written for a watery solution, to disguise the taste, as in the prescription given.

Watery Solution of Sodium Bromide to Disguise Taste

	Gm. or Cc.
R Sodium bromide	45
Water	45
Syrup of glycyrriza	to make 180

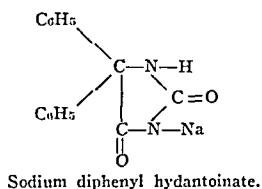
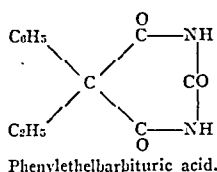
Label: One teaspoonful in glass of water or milk three times a day after meals.

This gives 15 grains (1 Gm.) three times a day, an average dose. If a cutaneous eruption or undue drowsiness appears, the amount must be reduced. If such symptoms remain absent but seizures persist, the dose can be increased to as high as 30 grains (2 Gm.) three times a day. Children require less in an amount roughly proportional to their weight.

15. Lennox, W. G.: The Epilepsies, chapter XII in Tice's Practice of Medicine, Hagerstown, Md., W. F. Prior Company, Inc. 10: 225, 1938.
16. Paskind, H. A., and Brown, Meyer: Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy; Stigmas of Degeneracy, Arch. Neurol. & Psychiat. 36: 1037 (Nov.) 1936.
17. Paskind, H. A.: Absence of Deteriorating Effects of Bromides in Epilepsy, J. A. M. A. 103: 103 (July 14) 1934.

18. Wuth, Otto: Rational Bromide Treatment: New Methods for Its Control, J. A. M. A. 89: 2013 (June 25) 1927.
19. Fremont-Smith, Frank; Dailey, Mary E., and Sloan, Dorothy H.: Distribution of Bromide in Blood Serum and Cerebrospinal Fluid, Arch. Neurol. & Psychiat. 33: 764 (April) 1935.
20. Cheavens, T. H.; Carter, C. F., and Barnwell, J. S.: Mental Disturbances Due to Bromide Intoxication: Clinical Study of Twenty-Two Cases, Texas State J. Med. 33: 375 (Sept.) 1937.

Phenobarbital.—Phenobarbital is phenylethelbarbituric acid; the chemical formula is $C_{12}H_{12}O_3N_2$. The structural formulas of phenobarbital and of dilantin sodium are placed together for comparison.



Phenobarbital is a white crystalline powder, odorless and stable in the air; 1 Gm. is soluble in about 1 liter of water. The drug is readily absorbed from the intestinal tract. The small fraction not oxidized is excreted rather slowly. A single large dose may protect against seizures as long as four days. In toxic doses phenobarbital decreases temperature, oxygen consumption and respiration and relaxes smooth muscle. Rarely a patient will present a cutaneous reaction, a fine maculopapular generalized rash which resembles that of scarlet fever (without the circumoral pallor) and disappears in a few days after medication is stopped. The medicine may then be resumed in smaller doses and probably increased without further cutaneous disorders. The rash seems to be an idiosyncrasy. With large doses appear nystagmus, loss of the abdominal reflex, ataxia, dizziness and finally mental confusion, psychosis and paranoid symptoms. These psychic symptoms appear more easily in epileptic patients who are subject to psychomotor seizures.

The question of whether phenobarbital contributes to mental deterioration is not raised as often as in the case of the bromides. While most patients take 1 or 2 grains (0.065 or 0.13 Gm.) a day for years without apparent harm, a few will complain of morning sleepiness and lethargy. On several occasions I have inadvertently precipitated psychic outbursts in patients by the intravenous injection of from 10 to 15 grains of soluble phenobarbital. In case doubt exists as to whether the drug is depressing the mentality, temporary sharp reduction or elimination of phenobarbital is a wise course.

Phenobarbital is now often used in attempted suicide.²¹ In a number of states it may be dispensed only with a prescription. The average fatal dose is from 3 to 4 Gm. (45 to 60 grains).²² The treatment of phenobarbital poisoning, after stomach washing, is the use of heroic doses of strychnine intravenously, from 5 to 20 mg. (one-twelfth to one-third grain) for the initial dose, repeated at half hour intervals with decreasing amounts as the patient's condition improves.²³ Epinephrine hydrochloride and picrotoxin in relatively large amounts are also used. When respiration is dangerously depressed a Drinker respirator may be life saving.

Dosage: Of phenobarbital from $1\frac{1}{2}$ to 2 grains (0.1 to 0.13 Gm.) a day is the average adult dose. Depending on the circumstances and the results (and if the patient is closely observed) this may be increased to 6 (0.4 Gm.) or even 9 grains (0.6 Gm.) a day.

The larger amounts should not be used unless the results, including the effect on seizures, are definitely better than with the average dose. If seizures are not decreased, the question of whether medication is of any benefit should be reopened. The frequency of dosage and other points have been discussed under general principles. The elixir of phenobarbital contains 0.016 Gm. (one fourth grain) of phenobarbital in 4 cc. of solvent.

Because of the poor solubility of phenobarbital, soluble phenobarbital ($C_{12}H_{11}O_3N_2Na$) is used for intravenous or subcutaneous injections. It contains 10 per cent less phenobarbital than the phenobarbital itself. The powder is put up in sterile ampules. It decomposes on boiling, so that the amount in the ampule (2 or 5 grains [0.13 or 0.32 Gm.]) should be dissolved in warm sterile distilled water drawn into a 10 cc. syringe before injection, which should be made very slowly. Tablets of soluble phenobarbital are sometimes prescribed for oral use on the assumption that they are absorbed more quickly. Liquid preparations of the sodium salt should not be kept more than three weeks, as absorbed carbon dioxide precipitates the acid form.

If it could be shown that bromides and phenobarbital act in a different manner or on different areas of the brain, a combination of the two drugs might be more effective than either alone. Some clinicians believe that their experience justifies a double barreled attack. Grinker²⁴ for the most resistant cases used from: 15 to 20 grains (1 to 1.3 Gm.) of bromide and $1\frac{1}{2}$ to $2\frac{1}{2}$ grains (0.1 to 0.16 Gm.) of phenobarbital three times a day, a maximum of 60 grains (4 Gm.) of bromide and $7\frac{1}{2}$ grains (0.5 Gm.) of phenobarbital daily.

The barbiturate family is a large one.

Dilantin Sodium.—Putnam and Merritt,²⁵ working on cats at the Neurological Unit of the Boston City Hospital, first demonstrated the value of dilantin sodium as an anticonvulsant. They then proved its usefulness for patients.²⁶ This drug is analogous to the barbiturates but is a derivative of glycolyl urea instead of malonyl urea. The structural formula has been shown beside that of phenobarbital. It is an odorless, white powder with a bitter taste. It is soluble in an aqueous solution at pH 11.7, which makes intravenous injection impracticable. Dilantin sodium is superior to phenobarbital in two important respects: it is a more effective anticonvulsant and it has a relatively weak hypnotic effect. Merritt and Putnam²⁵ have reported results on 267 patients treated for from two months to two years. They counted those patients who, considering their previous histories, were definitely better with the new treatment than with their previous (usually phenobarbital) treatment.

The proportion of patients showing freedom from or substantial decrease in the number of the different types of seizures is given in table 1. Many patients had more than one type.

The most striking improvement was in seizures of the psychomotor (psychic equivalent) type, a form which is little influenced by the bromides or phenobarbital. The least favorable results were encountered in petit mal attacks, in which there is transient loss of consciousness without muscle movement. In cases of

21. Hamburger, W. E.: A Study of the Promiscuous Use of the Barbiturates: Their Use in Suicides, *J. A. M. A.* **112**: 1340 (April 8) 1939.

22. Bastedo, W. A.: *Materia Medica*, Philadelphia, W. B. Saunders Company, 1937.

23. Weiss, Soma: Therapeutic Indications and Dangers of Intravenous Administration of Sodium-Phenyl-Ethyl-Barbiturate (Sodium Luminal) and Other Barbituric Acid Derivatives, *Am. J. M. Sc.* **178**: 390 (Sept.) 1929.

24. Grinker, R. R.: Proper Use of Phenobarbital in Treatment of Epilepsies, *J. A. M. A.* **93**: 1218 (Oct. 19) 1929.

25. Merritt, H. H., and Putnam, T. J.: Sodium Diphenyl Hydantoinate in Treatment of Convulsive Disorders, *J. A. M. A.* **111**: 1968 (Sept. 17) 1938; *Arch. Neurol. & Psychiat.* **42**: 1053 (Dec.) 1939.

pure petit mal, improvement was noted in only 47 per cent. In cases in which both petit and grand mal occurred, 61 per cent showed improvement of their petit mal. Petit mal attacks are often more frequent under dilantin sodium medication. Statements about petit mal by various authors cannot be reconciled, because some physicians classify as petit mal attacks which are really short psychic equivalent seizures.

In the little more than a year since the paper by Merritt and Putnam appeared, results in series of cases have been reported by Kimball,²⁶ Phillips,²⁷ Williams,²⁸ Blair, Bailey and McGregor,²⁹ Steel and Smith,³⁰ Hodgson and Reese,³¹ McCarton and Carson,³² Pratt,³³ Frost,³⁴ Weaver, Harrell and Arnold³⁵ and Robinson and Osgood.³⁶ The Council on Pharmacy and Chemistry of the American Medical Association³⁷ listed the results on 542 patients treated by thirteen clinicians. Among all these authors there is general agreement that if dosage is adequate the majority of patients are very definitely improved as far as their attacks are concerned. Some are miraculously improved, many are not improved and a few are worse. In addition, many with clouded mentality become clearer either because of the decrease in seizures or because the underlying dysrhythmia is improved.

TABLE 1.—Proportion Showing Freedom from or Decrease in Number of Seizures

Type of Seizure	Number of Patients	Per Cent of Patients Whose Seizures Were		
		Absent	Greatly Reduced	Total Helped
Psychic variants.....	39	62	23	85
Grand mal.....	227	60	14	74
Petit mal.....	104	39	20	59

The question whether dilantin sodium merely prevents the appearance of seizures or corrects the underlying dysrhythmia is of course exceedingly important. My associates and I¹² observed that the intravenous injection of the bromide or phenobarbital might temporarily prevent or abort the dysrhythmia of petit mal. Hyland and his associates³⁸ reported one case in which dysrhythmia was much improved by dilantin sodium. Merritt and I²⁹ find that in most of our cases in which examinations are made the electrical improvement does not parallel the clinical improvement. Electrical records

of patients who are rendered symptom free may continue as bad as ever. On the other hand, the record of a patient who has had abrupt and complete relief of attacks, especially of the psychomotor variety, may become essentially normal. The latter results bring forward the question whether drug treatment should be used for persons with dysrhythmia but without symptoms, with the hope of preventing the development of seizures. This question cannot as yet be answered. Also the lapse of time is insufficient to permit judgment as to the permanence of clinical improvements noted. So far there have been few relapses, these instances presumably comprising patients whose seizures but not their dysrhythmia had been improved.

Physicians who have used dilantin sodium are agreed that its successful administration requires careful supervision and manipulation of dosage. The guiding principle of treatment is to begin, in the adult, with 0.1 Gm. (1½ grains) three times a day and, if seizures continue, gradually to increase the dose until seizures are controlled or unpleasant side actions appear. Under this plan a large proportion of patients will manifest toxic symptoms. None of the symptoms are serious if noted promptly and proper action is taken. The most prominent are as follows:

Symptoms: Gastric symptoms are presumably due to the alkalinity of the drug. The capsules, which are usually taken with half a glass of water before meals, may be taken after meals. Nausea may be relieved by the addition of one-sixtieth grain (1 mg.) of belladonna.

The most prominent symptoms of the central nervous system are dizziness, instability of posture, ataxia, tremor, nystagmus and blurred or double vision. Clonic jerkings, which may appear, are probably petit mal.

Scarlet fever-like rash, dermatitis or itching of the skin may occur. Occasionally fever accompanies the rash.

Rarely a feeling of weariness and apathy is complained of. This may be relieved by the use of amphetamine sulfate, from 5 to 10 mg. taken in the first half of the day.⁴⁰ Even more rare is a complaint of hirsutism, especially in adolescent girls, or swelling of the face. Hyperplasia of the gums was reported in 57 per cent of Kimball's cases²⁶ but in only 3 per cent of the Boston City Hospital series. Kimball's contention that the scurvy-like appearance of the gums was due to deficiency of ascorbic acid has been disproved by Gruhitz.⁴¹

Although many patients are mentally brighter while taking dilantin sodium, several instances have been reported in which delusions or hallucinations, excessive activity or other psychotic manifestations occurred. After medication had been stopped and again started, the psychotic symptoms might or might not reappear.

The appearance of any of these symptoms may require reduction, temporary or permanent, in the amount of the drug ingested.

Dosage: The beginning dose of dilantin sodium for adults is 0.1 Gm. (1½ grains) taken three times a day before meals. The use of other anticonvulsant drug-

26. Kimball, O. P.: Treatment of Epilepsy with Sodium Diphenyl Hydantoinate, *J. A. M. A.* **112**:1244 (April 1) 1939.

27. Phillips, D. P.: Epilepsy as Prison Problem: Its Treatment with Sodium Diphenyl Hydantoinate, *J. Michigan M. Soc.* **38**:317 (April) 1939.

28. Williams, Denis: Treatment of Epilepsy with Sodium Diphenyl Hydantoinate, *Lancet* **2**:678 (Sept. 23) 1939.

29. Blair, Donald; Bailey, K. C., and McGregor, J. S.: Treatment of Epilepsy with Epanutin, *Lancet* **2**:363 (Aug. 12) 1939.

30. Steel, J. P., and Smith, Seymour: Epanutin in Epilepsy, *Lancet* **2**:367 (Aug. 12) 1939.

31. Hodgson, E. R., and Reese, H. H.: Clinical Experience with Dilantin in Epilepsies, *Wisconsin M. J.* **1**:968 (Nov.) 1939.

32. McCarton, W., and Carson, J.: Use of Sodium Diphenyl Hydantoinate, *J. Ment. Sc.* **85**:965 (Sept.) 1939.

33. Pratt, C. H.: Sodium Diphenyl Hydantoinate and Its Combination with Phenobarbital in the Treatment of Epilepsy, *J. Ment. Sc.* **85**:986 (Sept.) 1939.

34. Frost, J.: Sodium Diphenyl Hydantoinate in Treatment of Epilepsy: Preliminary Observations in Severe Cases, *J. Ment. Sc.* **85**:976 (Sept.) 1939.

35. Weaver, O. M.; Harrell, D. L., and Arnold, G. R.: Sodium 5,5-Diphenyl Hydantoinate in Fifteen Selected Cases of Epilepsy at the Virginia State Colony for Epileptics and Feeble-minded, *Virginia M. Monthly* **66**:522 (Sept.) 1939.

36. Robinson, C. J., and Osgood, Rudolf: Comparative Effects of Phenobarbital and Dilantin Sodium in the Treatment of Epilepsy, this issue, p. 1334.

37. Dilantin Sodium, Reports of the Council, *J. A. M. A.* **112**:1734 (Nov. 4) 1939.

38. Hyland, H. H.; Goodwin, J. E., and Hall, G. E.: Clinical Applications of Electro-Encephalography, *Canad. M. A. J.* **41**:237 (Sept.) 1939.

39. Unpublished data.

40. Cohen, Benjamin, and Myerson, Abraham: Effective Use of Phenobarbital and Benzadrine Sulfate (Amphetamine Sulfate) in Treatment of Epilepsy, *Am. J. Psychiat.* **95**:371 (Sept.) 1938.

41. Gruhitz, O. M.: Sodium Diphenyl Hydantoinate (Dilantin): Pharmacologic and Histopathologic Studies, *Proceedings of the Twenty-third Annual Meeting of the American Society for Experimental Pathology*, Toronto, April 26-29, 1939, p. 13.

should be continued in decreasing amounts for a week after dilantin sodium is started. The amount of dilantin sodium may be increased to a maximum of 0.6 Gm. a day (0.4 Gm. for children above 6 years of age). Children under 4 years of age may start with 0.03 Gm. (one-half grain) twice a day, increased if necessary to three or four times a day. For children who cannot take the capsule, the powder may be mixed with cream to disguise the bitter taste. It is dispensed in 0.03 Gm. (one-half grain) as well as in 0.1 Gm. (1½ grain) capsules. Therefore small differences in dosage may be provided for, which may bridge the difference between a condition of seizures or no seizures. If complete arrest of attacks is not secured with a full dosage of dilantin sodium, the addition of moderate amounts of phenobarbital (from 1 to 2 grains a day) is often beneficial. The optimum dose or combination of doses can be arrived at only by trial, and the prescription of a capsule which contains both dilantin sodium and phenobarbital in a fixed ratio is to be deprecated.

The fact that the successful prescription of dilantin sodium calls for the careful and personal supervision of a physician should prevent its exploitation by the mail order type of medical practice.

Status epilepticus is the dreaded condition in which convulsions come one after the other without consciousness being regained. In this emergency the intravenous injection of soluble phenobarbital is the physician's main reliance. The amount may be from 3 to 5 grains, repeated if necessary after six hours. The tendency is to overdose. Patients are often so thoroughly drugged that vital processes and consciousness are reestablished only with difficulty. In the maintenance of strength dissipated in violent convulsions, infusions of physiologic solution of sodium chloride or of dextrose solutions are of prime importance. If the patient's condition becomes such that complete exhaustion is feared, control of convulsions by the use of a volatile narcotic such as ether or chloroform is probably preferable to narcotization with phenobarbital. A cleansing enema followed by 4 drachms (15 cc.) each of paraldehyde and of olive oil left in the rectum is a valuable routine measure.

There may also be status epilepticus composed not of convulsions but of petit mal seizures. Patients will be in a condition of stupor or daze, able to speak or answer simple questions but incapable of mental work. Such periods may not be distinguishable from amnesic episodes of psychic epilepsy except by electro-encephalography. Administration of from 50 to 75 Gm. of dextrose or having the patient breathe a mixture of 10 per cent carbon dioxide in 90 per cent oxygen may break up the attack. Drugs seem to be useless.

COMPARATIVE VALUES

In the past decades, drugs by the ton have gone down the gullets of persons with epilepsy, but large, carefully controlled statistics on the comparative effect of bromides and of phenobarbital on the same extramural patients and on different types of seizures are lacking. The nearest approach is perhaps the tabulation of results of a large group of noninstitutionalized patients.⁴² Of 766 patients who had taken phenobarbital, 65 per cent reported improvement; of 289 taking bromides, 53 per cent, and of 124 taking "patent medicines," 40 per cent were apparently improved. The proportion reporting improvement in mentality

while taking these three types of medicines was, respectively, 30 per cent, 26 per cent and 13 per cent.

If the patient has grand mal or psychomotor seizures and his physician is informed and conscientious, I believe that dilantin sodium is the drug of choice. If adequate initial medical supervision is not available, if attacks are predominantly and unmistakably petit mal (and if dilantin sodium fails) then phenobarbital, or as a third choice bromides, must be resorted to.

COMPARATIVE COSTS

For patients who must use a drug for an indefinite number of years and whose earning capacity is seriously impaired, the cost of treatment is an important consideration. The poor patient who must buy on a hand to mouth basis pays per tablet ten times as much for a few tablets as he would pay for 1,000. A given amount of phenobarbital costs five times more in quarter grain than in 1½ grain tablets. As indicated in table 2, the drug therapy of epilepsy need not be expensive—less than \$3 a year.

Phenobarbital is cheaper than bromides, and tablets are much cheaper than solutions. Striking is the three-fold premium paid yearly for the trade name Luminal. I do not know of a medical report which would indicate

TABLE 2.—Yearly Cost of Drugs Used for Epilepsy

Preparation	Quantity Bought and Price	Daily Dose, Grains	Cost per Year
Phenobarbital, 1½ grain tablets.....	100 @ \$0.75	1½	\$2.75
Sodium bromide, 10 grain tablets.....	1,000 @ 2.00	45	4.75
Luminal (phenobarbital, Winthrop), 1½ grain tablets.....	50 @ 1.25	1½	9.10
	6 oz. @ 0.80	45	18.25
	100 @ 2.00*	0.3	21.00
	16 oz. @ 1.50	1½	26.30
	4 wks. supply	Unknown	50.00

* The retail price in Boston drugstores is from \$1.75 to \$2.50.

† Including cathartic and other unimportant ingredients.

that phenobarbital sold under the name of Luminal is more effective in controlling seizures than phenobarbital sold by that name.

PROPRIETARY DRUGS

Phenobarbital (plus other unimportant drugs) sold by a mail order drug concern costs eighteen times as much as undisguised phenobarbital. The poor person who buys treatment by mail because he "can't afford a doctor" could, with the \$50 extra which he pays yearly for the medicine, purchase excellent medical advice (provided of course he knew where to find it).

More than any other group of patients, those with epilepsy are subject to a barrage of form letters from proprietary drug companies which promise to cure the disease or refund the money. Thirty-eight of these so-called epilepsy cures have been analyzed, and the results are published in a brochure by the American Medical Association.⁴³ The principal drug is bromide or phenobarbital, usually the latter. In recent years the number of advertised "cures" has decreased but the skillfulness of advertising has increased.

The physician who merely asks the routine questions and with a hopeless shake of his head writes a prescription must not be surprised if his epileptic patient goes to an osteopath or responds to the invitation brought by the mailman. One remedy for the medicine-by-mail evil lies in telling the public what epilepsy is

42. Personal unpublished data.

43. Epilepsy Cures and Treatments, Chicago, American Medical Association.

and what physicians can do for patients afflicted with it. Toward this end the group of physicians called the American League Against Epilepsy has organized a Laymen's League Against Epilepsy. Members pay dues of either \$1 or \$5 a year for the benefit of research and receive in return a series of bulletins which give the background facts about epilepsy that patients and the public should know.

THE CHANCE OF SUCCESS

What rewards may doctor and patient expect from faithfully followed drug therapy? Because no treatment is as yet specific (though the sedatives which slow electrical waves approach this for grand mal), treatment of each patient is symptomatic and expectant and therefore individual. Discouraging generalizations do not apply to a given patient. The bloodiest of battles has thousands of survivors.

Average results vary, of course, for different types of seizures and for different surrounding conditions. The prognosis is different also for the three main considerations, namely cessation of seizures, normal mentality and life. As regards both seizures and life, the outlook of successful drug therapy is best if the following conditions apply: in grand mal, if seizures began recently or after childhood or come infrequently or if the total number is small; if mentality is normal or if the brain is uninjured; if there is no family history of epilepsy or mental disease, and if there is sufficient money, intelligence and cooperation to follow the treatment instituted.

As regards maintenance of normal mentality, the outlook is best if seizures are petit mal but in other respects parallel the outlook for cessation of seizures.

Statistics concerning patients receiving active medical attention need to be studied with respect to their source. On the one hand the records of clinicians may be artificially optimistic. Thus Pollock⁴⁴ in 1937 saw eighty-five patients whom he had treated with bromides for more than a year. Of these, thirty-nine (46 per cent) had been without seizures for a year or more. He must have been treating an unusually mild group, for 72 per cent of the eighty-five had a previous history of a remission lasting a year or more. Probably the surviving clientele of any physician is weighted with favorable cases, for epileptic patients are notorious shoppers. They know that time is the essence of help and quite properly refuse to be under the treatment of one physician year after year if they do not experience improvement. Also the greater his reputation (and his fees) the fewer the number who can afford to continue profitless treatment.

Of any large group of patients receiving bromide or phenobarbital a few (perhaps from 10 to 20 per cent) will cease to have attacks, a larger proportion (perhaps from 20 to 30 per cent) will not be helped and the majority (from 50 to 70 per cent) will receive varying degrees of benefit. These are but estimates. The proportion benefiting should be revised upward if dilantin sodium is used.

A seizure is an irregular and unpredictable symptom. In judging results of treatment the observer must remember that remissions of a year or longer occur without apparent cause in about 20 per cent of patients. Furthermore, although a pathologic condition such as "cerebral dysrhythmia" may perhaps be spoken of as "cured," a symptom such as "seizures" can only be

arrested. A remission of seizures, no matter how long, may be followed by relapse. In his conduct of a case the physician will with humility realize the odds against him but will work with and not against the healing physiologic mechanisms and will remember that very small therapeutic weights may tip a heavy scale in a favorable direction.

SUMMARY

Epilepsy is a paroxysmal cerebral dysrhythmia. The ideal drug, when found, will be a regulator of the rate of the electrical waves of the brain. Because the rate in grand mal is abnormally fast, in psychic seizures abnormally slow and in petit mal alternately fast and slow, the commonly used sedatives (which tend to slow the rate) are principally useful for grand mal.

Dilantin sodium possesses two advantages over phenobarbital: its greater effectiveness in controlling grand mal and psychomotor seizures and its absence of hypnotic effect.

818 Harrison Avenue.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ABSTRACT AND APPRECIATION.

HOWARD A. CARTER, Secretary.

ABSTRACT OF MINUTES, MEETING OF COUNCIL ON PHYSICAL THERAPY, DEC. 1-2, 1939

The Council on Physical Therapy held its annual meeting on Dec. 1-2, 1939, at the headquarters of the American Medical Association. The members present were Dr. Harry E. Mock, chairman, Drs. Anthony Cipollaro, William W. Coblenz, John S. Coulter, Arthur U. Desjardins, Frank D. Dickson, Walter E. Garrey, Frank H. Krusen, Frank R. Ober, Ralph Pemberton and Horatio B. Williams.

Dr. Mock was reelected chairman and Dr. Garrey vice chairman.

RESEARCH

Financial aid was awarded in the form of research grants to four investigators to assist in experimental work on the effect of heat in bone and joint repair, investigation of shielding diathermy equipment, investigation of dosage meters, and artificial respiration. The reports on previous grants awarded by the Council gave a creditable showing for the amount of money expended. Numerous requests for aid in research were considered at the meeting.

RADIO INTERFERENCE

A committee of the Council was appointed to continue the investigation relative to the most desirable means for eliminating radio interference. Reduction of power output to 325 watts, as read on a lamp load, was suggested as a minimizing influence. Nothing specific was proposed.

ROENTGEN RAYS AND RADIUM

The question of the increasing sale of small x-ray units to unqualified physicians was discussed at great length. It was agreed that there was little that could be done at the present time to discourage this practice, except perhaps to prepare articles dealing with the important phases of the problem: i. e. minimum standards for fluoroscopic equipment and the dangers of using fluoroscopes in the setting of fractures, and to give sound basic information.

The work of a group of consultants on roentgen rays was discussed. The Council was informed that two articles, one on the dangers of roentgen rays and the conditions under which their use is dangerous and one on the minimum standards for fluoroscopes, have been scheduled for publication. An article on the indiscriminate use of radium or radon by physicians without special training is to be published in the near future.

⁴⁴ Pollock, L. J.: Remissions of Attacks in Epilepsy Treated with Sodium Bromide, J. A. M. A. 110: 652 (Feb. 26) 1937.

ACCEPTANCE OF SUNLAMPS

The Council revised and adopted requirements for the acceptance of sunlamps, which appeared in THE JOURNAL of January 27, 1940.

EDUCATION IN PHYSICAL THERAPY

Much progress in the activities of the Council and its consultants in the field of education was reported. The members have been engaged in giving lectures and radio talks, publishing articles and books, reorganizing and planning physical therapy departments, attending meetings, preparing motion picture films and arranging exhibits.

It was voted that the Council confer with the Council on Medical Education and Hospitals to make a concerted appeal to medical schools which are not teaching physical therapy. The Council also voted to ask the Council on Medical Education and Hospitals to send out another questionnaire on the subject of undergraduate instruction and courses for physical therapy technicians, similar to the one sent out in 1936.

Work on the revision of the Council's definitions has been started. The Council voted to have a representative group from the Council attend the conference on nomenclature scheduled for March 1940, at which time this matter could be studied.

The Council appointed the following consultants to aid the Council in its educational program: Dr. Fred Moor, Dr. Frances Baker, Dr. F. H. Ewerhardt, Dr. William Northway, Dr. Walter Solomon, Dr. Walter Zeiter, Dr. Earl C. Elkins, Dr. Arthur Watkins, Dr. Muriel Downer and Dr. Benjamin Boynton.

EXHIBIT ON LAME BACKS

In accordance with the suggestion made at the last annual meeting, preparations have been made for an exhibit on lame backs to be shown at the coming A. M. A. session.

HANDBOOK ON AMPUTATIONS

It was voted to prepare a small Handbook on Amputations, similar to the Handbook of Physical Therapy.

HEATING PADS

The Council voted not to consider electric heating pads, but it recommended that such pads have the approval of the Underwriters' Laboratories relative to safety and fire hazard.

ELECTROCARDIOGRAPHS

Owing to the fact that electrocardiograph apparatus are being widely marketed and the Council is continually being requested for information on these units, the Council deemed it advisable to take up the consideration of such apparatus. It therefore voted to seek the cooperation of the American Heart Association by asking it to appoint a group of consultants in the field to aid in the work.

AUDIOMETERS AND HEARING AIDS

Progress in the field of audiometers and hearing aids has been very satisfactory, as the result of the splendid cooperation of its consultants. At the last meeting the Council voted to publish an article reviewing the progress made in this field.

AN APPRECIATION

The Council on Physical Therapy frequently is called on to solicit the services of members of the profession who are specialists in their particular fields. During the past year the Council has received most able assistance in its work and the Council wishes to express its appreciation to the following consultants for their friendly helpfulness:

Drs. Fred L. Adair, M. Herbert Barker, William Bierman, R. C. Burt, Milton B. Cohen, Geza de Takats, Earl C. Elkins, F. H. Ewerhardt, Samuel Feinberg, Harry S. Gradle, John S. Hibben, Archibald Hoyne, K. K. Jones, Louis Katz, Disraeli Kobak, Arno Luckhardt, A. A. Martucci, C. O. Molander, Cary McCord, Tell Nelson, S. Perry Rogers, E. M. Smith Jr., Grant E. Ward, Miss Edith Quimby and Mr. S. L. Osborne.

Audiometers and Hearing Aids.—Drs. C. C. Bunch, George M. Coates, E. P. Fowler, Henry Hartig, Austin Hayden, Isaac Jones, Douglas Macfarlan, C. Stewart Nash, Horace Newhart, Paul Sabine, B. R. Shurly and W. P. Wherry.

Educational Work.—Bernard Fantus, Richard Kovacs, Franklin P. Lowry and William Schmidt.

Ophthalmologic Devices.—Drs. Francis Heed Adler, Charles A. Bahn, S. Judd Beach, William L. Benedict, Conrad Berens, Alfred Cowan, John Evans, Jonas Friedenwald, Sanford Gifford, Walter B. Lancaster, William H. Luedde and Clifford B. Walker.

Röntgen Rays and Radium.—Drs. L. F. Curtiss, William E. Chamberlain, Arthur C. Christie, Edwin C. Ernst, Gioacchino Failla, Thomas A. Groover, Fred M. Hodges, George Winslow Holmes, John T. Murphy, R. R. Newell, E. P. Pendergrass, George Pfahler, U. V. Portmann, Lauriston Taylor and J. F. Weatherwax.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

MAGNESIUM TRISILICATE.—Magnesium meso-trisilicate ($2\text{MgO} \cdot 3\text{SiO}_2 \cdot n\text{H}_2\text{O}$).—The magnesium salt of meso-(deutero-) trisilicic acid.

Actions and Uses.—It neutralizes the hydrochloric acid of the gastric juice by chemical action and probably by adsorption. It adsorbs various other substances, including alkaloids and pepsin, but it does not interfere with peptic digestion nor does it induce alkalosis. It is nontoxic in ordinary amounts, but large doses sometimes induce diarrhea because of the magnesium chloride formed. It is used for the relief of gastric hyperacidity and pain in gastric and duodenal ulcer.

Dosage.—From 1 to 4 Gm. (15 to 60 grains) before meals or food taken at other times, the single dose and the frequency of repetition depending on the degree of acidity and the relief afforded.

Magnesium trisilicate occurs as a fine, white, odorless, tasteless powder, insoluble in water and partially soluble in acids. An aqueous suspension is neutral to litmus. It completely passes through a 170 mesh sieve, and at least 85 per cent passes a 325 mesh sieve.

Transfer 5 Gm. of magnesium trisilicate to a 250 cc. beaker, add 75 cc. of distilled water, and boil for fifteen minutes. Allow the mixture to separate, decant the supernatant liquid through a filter, evaporate to dryness on the steam bath and extract with 50 cc. of water; filter and make up the resultant clear filtrate to 100 cc. Evaporate 50 cc. of this solution to dryness on a steam bath in a tared platinum dish and dry at 110 C.: the residue shall not exceed 1.2 per cent. Moisten the residue with 2 cc. of hydrofluoric acid and evaporate to dryness on the steam bath; remove the residue with 50 cc. of hot water and filter; add 1 cc. of diluted hydrochloric acid and 10 cc. of barium chloride solution, and digest for two hours. Collect the precipitate on a sintered glass filter, wash thoroughly and dry at 120 C.: the sulfate content does not exceed 0.7 per cent. To another 20 cc. portion add two drops of phenolphthalein and titrate with tenth-normal hydrochloric acid: the amount of acid required should not be more than 0.5 cc. To a 10 cc. portion add 5 cc. of silver nitrate solution and 1 cc. of nitric acid; compare with a standard containing 0.5 cc. of fifteenth-normal hydrochloric acid in 10 cc. of distilled water, following the same procedure: the chloride content shall not exceed 0.1 mg. per gram.

Transfer 3 Gm. of magnesium trisilicate to a 250 cc. beaker, add 50 cc. of distilled water and 5 cc. of hydrochloric acid; boil for twenty minutes. Nearly neutralize with ammonium hydroxide solution, filter, wash the precipitate, make the filtrate faintly alkaline to phenolphthalein with ammonium hydroxide and discharge the color with tenth-normal hydrochloric acid; add 10 cc. of hydrogen sulfide solution and compare at the end of ten minutes with a standard solution containing 0.15 mg. of lead acetate: the lead content shall not exceed 0.005 per cent. Transfer approximately 1 Gm. of magnesium trisilicate, accurately weighed, to a covered platinum crucible and raise the temperature over a period of ten minutes to dull red heat, igniting to constant weight over a Meker burner; cool and weigh: the loss in weight shall not be more than 33 per cent nor less than 29 per cent.

Transfer approximately 1.5 Gm. of magnesium trisilicate, accurately weighed, to a 250 cc. Erlenmeyer flask, add 50 cc. of normal sulfuric acid, heat on the steam bath for fifteen minutes with frequent stirring; cool to room temperature, and titrate the excess acid with normal alkali, using methyl orange as indicator: the magnesium oxide content should not be less than 20 per cent nor more than 22 per cent.

Transfer approximately 0.7 Gm. of magnesium trisilicate, accurately weighed, to a 150 cc. beaker, add 10 cc. of normal sulfuric acid and heat on the steam bath for one and one-half hours with frequent shaking; add 25 cc. of water and heat for fifteen minutes. Decant the liquid through an ashless filter paper and wash the residue three times by decantation, finally washing it into the paper. Dry the precipitate and paper in a platinum dish and ignite over a Meker burner for one-half hour, cool and weigh. Moisten the residue with water,

add 0.5 cc. of sulfuric acid and 3 cc. of hydrofluoric acid, evaporate to dryness in a hood, finally ignite for two minutes, cool and weigh: the loss in weight due to silicon dioxide is not more than 48 per cent nor less than 45 per cent. The ratio of magnesium oxide to silicon dioxide is between 1:2.20 and 1:2.30.

Transfer 1 Gm. of magnesium trisilicate to a glass stoppered flask, add 16 cc. of a solution containing 5 mg. of methylene blue in each cubic centimeter and dilute to 75 cc.; shake continuously for ten minutes and at intervals during one hour. Allow the mixture to separate, and centrifuge a portion of the liquid or decant through a fine filter: the filtrate should be clear and colorless.

Magnesium Trisilicate-Mallinckrodt.—A brand of magnesium trisilicate-N. N. R.

Manufactured by Mallinckrodt Chemical Works, St. Louis, Mo. No U. S. patent or trademark.

HALIBUT LIVER OIL WITH VIOSTEROL (See New and Nonofficial Remedies, 1939, p. 517).

I. V. C. Halibut Liver Oil with Viosterol (A. R. P. I. Process) in Oil.—A brand of halibut liver oil with viosterol-N. N. R.

Manufactured by the International Vitamin Corporation, New York. No U. S. patent. U. S. trademark 314,818. The viosterol used is manufactured by the American Research Products, Inc., a subsidiary of General Mills, Inc., Minneapolis, U. S. patent 2,117,100.

Soluble Gelatin Capsules I. V. C. Halibut Liver Oil with Viosterol (A. R. P. I. Process) in Oil, 3 minims: Each capsule contains 8,500 U. S. P. units of vitamin A and 1,700 U. S. P. units of vitamin D.

I. V. C. halibut liver oil with viosterol is prepared by combining liver oil, viosterol and cod liver oil in such proportions that the finished product has the required N. N. R. vitamin A and D potency.

Council on Foods

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT BY DR. ROSE IN WHICH IS PROVIDED A REVIEW OF AVAILABLE EVIDENCE ON THE NUTRITIVE VALUE OF QUICK-FROZEN FOODS. THIS REPORT WAS PREPARED BY DR. ROSE AT THE REQUEST OF THE COUNCIL. PARTLY ON THE BASIS OF THIS REPORT THE COUNCIL HAS VOTED TO GIVE CONSIDERATION TO QUICK-FROZEN VEGETABLES AND FRUITS WITH A VIEW TO INCLUSION IN THE LIST OF ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

THE EFFECT OF QUICK FREEZING ON THE NUTRITIVE VALUES OF FOODS

MARY SWARTZ ROSE, PH.D.

NEW YORK

The development of methods for the rapid reduction of the internal temperatures of food materials to very low levels has resulted in a phenomenal growth of the frozen food industry during the past ten years. According to the United States Bureau of Foreign and Domestic Commerce,¹ the quantity of quick-frozen foods in 1937 was more than 273,000,000 pounds, and an increase of 47 per cent was estimated for 1938, which would raise the production to 480,000,000 pounds. Of the total quantity marketed in 1937, approximately 50 per cent consisted of vegetables, of which nearly half were peas, 12 per cent of chicken and poultry, 12 per cent of fish, 11 per cent of fruits, of which more than half were strawberries, 9 per cent of beef and 2 per cent of lamb.² Fish, because of the necessity of preserving the product even for almost immediate consumption, was the first food to be commercially quick-frozen. Now the freezing of haddock and salmon fillets and codfish steaks is an important part of the fishing industry, and oysters, clams, scallops, shrimps, crab and lobster meats have been added to the list of packaged items.

From the Nutrition Laboratory, Teachers College, Columbia University.
1. Mundee, C. R., and Percher, F. C.: Quick-Frozen Foods, U. S. Dept. of Commerce, Bureau of Foreign and Domestic Commerce, April 1938.
2. Fisher, A. R.: The Development of the Quick-Frozen Food Industry, Butcher's Advocate 104:25, 1938.

The quick freezing of fruits has grown out of the cold-pack berry industry of the Northwest. Besides strawberries, a great variety of other berries, cherries, apricots, grapes, pineapples, prunes, rhubarb, figs and peaches are among the fruits now being packed. Among the vegetables being successfully quick-frozen besides peas are lima beans, corn, string beans, spinach, broccoli, asparagus, brussels sprouts, artichokes and cauliflower. It has become important, therefore, to learn what changes may occur in foods subjected to this new mode of preservation and likely to be kept in storage for relatively long periods.

The task of freezing animal products is simpler than that of freezing fruits and vegetables because the animal cells are more elastic and less readily disrupted than the plant cells. The usual temperature range for rapid freezing is from -17.8°C . (0°F .) to -40°C . (-40°F .). In lowering the temperature from 0°C . (32°F .) to -26.1°C . (-15°F .) about 85 per cent of the water of the food crystallizes as ice. In the case of foods frozen slowly, the ice crystals may be many times the size of the individual cells, piercing and tearing the delicate cell walls. On defrosting this causes excessive leakage, which results in change of texture and loss of flavor. Extremely low temperatures are necessary to pass the products as rapidly as possible through the zone of maximum crystallization, 0°C . (32°F .) to -5°C . (23°F .) and obtain a temperature of -17.8°C . (0°F .) within the product. In flesh foods the colloidal gel is largely reversible and when the frozen product is thawed the cells reabsorb most of the water, but in plant products the gel is irreversible, the inelastic cell walls rupture easily and the water is not reabsorbed after thawing (Birdseye,³ Woodruff⁴); hence fruits and vegetables lose their turgidity and original firm structure. Through the development of modern methods in quick freezing, nearly all vegetables with the exception of tomatoes, lettuce and celery can be readily frozen and stored for many months without substantial change in quality.

TYPES OF PROCESS USED IN QUICK FREEZING

There are various methods of quick freezing. The main types may be briefly classified as follows:

1. **Direct immersion.** The product is immersed in a refrigerated liquid, which freezes at approximately -19°C . (-22°F .). Fish are immersed in a sodium chloride brine and fruits in syrup, which is removed by centrifuging before the fruits are packaged.

2. **Indirect immersion.** The food is placed in metal containers which are immersed in a calcium chloride brine which freezes at around -40°C . (-40°F .). The containers may be made in compartments so that individual pieces can be frozen, or the food may be frozen in a solid block of water, brine or syrup ice.

3. **Indirect contact, single plate method.** The substance to be frozen is placed on a metal plate the under side of which is in contact with the freezing brine. In practice there may be a metal pan floating through channels of cold calcium chloride brine or a conveyor with metal plates filled with fish which drop into the cold brine. The food may or may not be packaged and may or may not be under a certain amount of compression.

4. **Indirect contact, multiple plate method.**

3. Birdseye, Clarence: The Quick-Freezing of Perishable Foods, *Refrigeration* 74:547 (June) 1930; Where Quick-Frozen Vegetables Stand Today, *Food Industries* 3:213 (May) 1931.

4. Woodruff, J. G.: Preservation Freezing: Some Effects on Quality of Fruits and Vegetables, Bull. 169, University System of Georgia Agricultural Experiment Station, 1931.

(a) Double belt freezers consist of two flexible metal belts which hold the food placed between them at any desired pressure and carry it into a tunnel, where brine sprays at temperatures of from -42.8°C . (-45°F .) to -45.6°C . (-50°F .) play on the belts but do not come into contact with the food.

(b) Multiple plate freezers consist of several layers of hollow refrigerated metal plates in the insulated cabinets. When these are loaded with the product to be frozen the pressure is adjusted to insure perfect contact between plate and food, and the refrigerant is circulated in the plates until freezing takes place. Plates maintained at a temperature of -13°C . (8.6°F .) can completely freeze 2 inch packages of products in ninety minutes. Unpacked fish fillets and steaks can be frozen in from five to ten minutes. The plate froster may have its refrigerating machinery mounted on a frame underneath the freezing cabinet so that it can be moved from place to place for the preservation of seasonal products.

5. Spray freezing. This may mean the spraying of cold brine against the sides of metal containers or freezing the loose product on wire mesh or stainless sheet conveyers through high velocity sprays. These may be of salt brine for meats, sea foods and poultry, sugar solutions for berries and fruits, and neutral sugar-salt solutions for vegetables.

The rapid development of refrigerated lockers is stimulating the quick freezing of meats, vegetables and fruits in rural districts. In 1937 there were reported 1,300 local plants, containing some 450,000 lockers, with a total capacity of more than 100,000,000 pounds of produce and their number is rapidly increasing.

SPECIAL PROBLEMS IN SELECTION AND PREPARATION OF FOODS FOR QUICK FREEZING

The chain of steps leading from the producer to the consumer has presented many problems besides actual freezing, such as the selection of suitable varieties of fruits and vegetables, the treatment of the raw material before freezing, and the packaging, storage and transportation of the frozen products. Different varieties of the same food have manifested very different freezing qualities, and even the same variety produced under different soil or climatic conditions may vary considerably in suitability for quick freezing. Thus, of more than 100 varieties of peas, only two or three are regarded as satisfactory for quick freezing. Some fruits, for example raspberries, can be packed in a dry form without changes occurring in their flavor or texture, but others, as strawberries, lose their color and flavor unless sugar is added and have to be sliced to get a quick impregnation of sugar. Only varieties which yield firm slices are suitable for such treatment. Different varieties of peaches show marked difference in oxidative browning and change in texture and flavor.

The quality of all raw materials must, of course, be carefully safeguarded. In case of sea foods, autolysis must be prevented lest it produce distasteful changes in flavor. Hence fish are usually brought directly from the boats to the freezing plant, cleaned, washed and frozen "round" or cut into fillets of uniform size. They are also being frozen aboard the trawlers from which they are caught. Fruits are washed, cleaned, sorted, usually sliced and sometimes pulped before freezing. They are generally packed in small containers with sugar or syrup which covers the fruit and helps prevent drying and oxidation. In vegetables, freshness is of the greatest importance and the sugar content and tenderness of the raw material may determine the acceptability of the finished product. Vegetables, before being frozen, must be washed, graded, trimmed and

subjected to a preliminary scalding or blanching to fix the desirable color and retard enzyme action, which is one of the causes of spoilage in storage (Diehl, Dingle and Berry,⁵ Arighi, Joslyn and Marsh,⁶ Tressler and Evers⁷). This process further cleanses the vegetable, decreases the number of micro-organisms and reduces the bulk. All waste is eliminated, such as shells on peas, outer leaves on brussels sprouts, skins on peaches, and fat, gristle and bone in meats, leaving the food in a form ready to cook and effecting economy of space. The waste elimination ranges from 15 to 80 per cent in meats and sea foods and from 33 to 36 per cent in frozen vegetables.

Packaging must be accomplished in moisture-proof, vapor-proof materials to minimize desiccation, and for many types of food the packages must be watertight. It is also important that the containers minimize enzymic and hydrolytic changes by preventing access of outside air. The fats of most flesh products are readily oxidized by contact with air during cold storage unless held in check by a practically airtight protective coating and low storage room temperatures. Since storage may be for long periods, it is considered essential that frozen products shall remain in perfect condition at temperatures of from -20.6°C . (-5°F .) to -23.3°C . (-10°F .) for at least nine months or a year. Paper containers are widely used in the form of cups, tubs, containers with metal top and bottom and paper sides, and rectangular cartons of various sizes. Liners of waterproof vegetable parchment papers and cellophane are used and cardboard cartons are usually cold-waxed. Outer wrappers may be of heat-sealed glassine, paraffined paper and the like. Packaging standards set up by the Northwest Frozen Foods Association in 1938 call for a consumer carton based on the size for 12 ounces of peas to be used for other vegetables regardless of weight and $2\frac{1}{2}$ and 5 pound cartons for institutions. The consumer size provides servings for four people, thus giving the housewife a convenient purchasing unit. Refrigeration must be maintained during transportation; hence refrigerated railway cars must be heavily insulated. Refrigerated trucks have been designed, with silica gel and mechanical refrigeration systems built in, and low temperature is also maintained by means of solidified carbon dioxide, cans of frozen brine and various patented devices. For retail marketing, display cabinets which will hold the foods at temperatures of from -17.8°C . (0°F .) to -23.3°C . (-10°F .) are required. The expense of such cabinets has been a major problem in the distribution of frozen foods. Refrigeration may be by mechanical units built into the case which can be plugged into the regular lighting circuit or, if several cases are to be kept cold, by refrigerating equipment placed in the basement and connected with all the cabinets. Cases have also been designed to use solidified carbon dioxide, with suitable control of the evaporating carbon dioxide to insure an even temperature.

Retailing of frozen foods is still in the experimental stage. It is estimated that, of the foods packed in 1937, 5 per cent went to processors, bakeries, ice cream manufacturers and preservers, 40 per cent to hotels and institutions and 55 per cent to the retail trade.

5. Diehl, H. C.; Dingle, J. H., and Berry, J. A.: Enzymes Can Cause Off-Flavors Even When Foods Are Frozen, *Food Industries* 5: 300 (Aug.) 1933.

6. Arighi, A. L.; Joslyn, M. A., and Marsh, G. L.: Enzyme Activity in Frozen Vegetables, *Indust. & Engin. Chem.* 28: 595 (May) 1936.

7. Tressler, D. K., and Evers, C. F.: *The Freezing Preservation of Fruits, Fruit Juices and Vegetables*, New York, Avi Publishing Company, Inc., 1936.

BACTERIOLOGIC RESEARCH ON QUICK-FROZEN
FOODS

The value of freezing in reducing the number of micro-organisms present in foods has long been recognized, but some special studies have been made of quick-frozen foods. Properly frozen and stored hamburger steak was found by Geer, Murray and Smith⁸ to be consistently lower in bacterial count than the best grade of the fresh product for sale in high class meat markets. The reduction during freezing averaged 79.5 per cent and storage one month at -17.8°C . (0°F .) reduced the numbers still further. For fish fillets, Fitzgerald and Conway⁹ suggest as a practical maximum a bacterial count after forty-eight hours of storage of 100,000 and recommend that if the count on any daily sample exceeds this it shall be held at -17.8°C . (0°F .) until the total number is reduced to this amount. A study of spinach and kale by Smart and Brunstetter¹⁰ showed that blanching, freezing and storage at -8.6°C . (16.5°F .) reduced the bacterial count more than 99 per cent.

Prescott and Tanner¹¹ report that of typhoid bacilli very few remain alive at 0°C . (32°F .) for as long as three to five weeks and conclude that there is little danger from food frozen and stored at temperatures below 0°C . (32°F .). According to Lochhead and Jones,¹² micrococci and species of flavobacteria survive freezing much longer than other groups. When asparagus, spinach, peas, beans and corn, carefully washed and blanched, were packed and cooled as soon as possible and held at -17.8°C . (0°F .) for periods of sixteen or thirty weeks, all these products were found to harbor one or more strains of staphylococci capable of elaborating enterotoxigenic substances under certain circumstances. But a special test made with inoculated corn defrosted and held either in the household icebox at from 5°C . (41°F .) to 10°C . (50°F .) or in the electric refrigerator at 3.9°C . (39°F .) for two weeks was entirely negative. Fruits, because of their acidity, have fewer micro-organisms than vegetables, and fruits packed with sugar have less than those packed without it. Tests for *B. coli* in frozen fruits, vegetables and oysters held approximately one year at -12.2°C . (10°F .) made by Fellers¹³ were negative, but corn, peas and beans yielded cultures resembling *B. aerogenes* and *B. cloacae*. Berries frozen and stored for one year at -9.4°C . (15°F .) were found by Berry¹⁴ to have a reduction of total bacteria of 99 per cent. Similar results after storage for nine months at -6.7°C . (20°F .) were obtained by Smart.¹⁵

The possibility of botulism occurring through the aging of frozen foods has received due consideration. Wallace and Park¹⁶ examined various fruits and

vegetables after inoculation with detoxified cultures of types A and B of *Clostridium botulinum* and other samples treated with a toxic culture of each of these strains and found that neither the toxins nor the spores were destroyed after being frozen for one year at -16°C . (3.2°F .), but Prescott and Geer¹⁷ report that spinach heavily inoculated with detoxified spores of type A *Clostridium botulinum* and frozen at from -15°C . (5°F .) to -30°C . (-22°F .) showed no development of toxin in more than one month if held below 10°C . (50°F .). Prescott and Tanner¹¹ found that only small numbers of *Salmonella* and *Clostridium botulinum* can survive subjection to temperatures of from -30°C . (-22°F .) to -40°C . (-40°F .) for several weeks. On the whole, as has been pointed out by Jenkins, Tressler and Fitzgerald,¹⁸ temperatures below -17.8°C . (0°F .) are necessary for a year's storage of quick-frozen vegetables. All investigations indicate the great importance of sanitary care of foods before freezing, holding at sufficiently low temperature during storage, and cooking promptly after thawing or without thawing at all. It is important that frozen foods be recognized as "perishable." In a very few hours after thawing there is a considerable increase in the number of bacteria.

The effect of low temperatures on encysted *Trichinella spiralis* has been studied by Augustine,¹⁹ who found that raw pork can be rendered safe so far as this organism is concerned by lowering its temperature rapidly to -35°C . (-31°F .) or by lowering it to -17.8°C . (0°F .) and holding for at least twenty-four hours at that temperature. The advantage of quick over slow freezing lies in the ability to reduce with certainty the temperature of the entire piece of meat to a point at which the encysted parasites will be destroyed.

QUICK FREEZING REDUCES COOKING TIME

The cooking of quick-frozen foods presents no special problems. Practically all products may be put on to cook while still solidly frozen or immediately after partial thawing. Quick-frozen vegetables require only one half to two thirds as much time as fresh. Quick freezing renders meats more tender. Thus Tressler and his associates²⁰ found that grade C steak after five weeks of storage was as tender as grade A steak prior to freezing and that sirloin steaks aged four days at from 1.1°C . (34°F .) to 2.8°C . (37°F .), and then cut, packaged, quick-frozen and stored at -27.8°C . (-18°F .) for a month or longer, were as tender as steaks aged six to seven days and then tested immediately without freezing.

NUTRITIVE VALUES OF QUICK-FROZEN FOODS

Studies of the chemical composition of quick-frozen foods in relation to nutritive value have mainly been directed to the possible loss of vitamins. However, Watson and Fellers²¹ investigated the effect of freezing on the proteins of the blue crab (*Callinectes sapidus*)

8. Geer, L. P.; Murray, W. T. and Smith, E.: Bacterial Content of Frozen Hamburg Steak, *Am. J. Pub. Health* 27: 673 (July) 1933.

9. Fitzgerald, G. A., and Conway, W. S., Jr.: Sanitation and Quality Control in the Fishery Industries, *Am. J. Pub. Health* 27: 1094 (Nov.) 1937.

10. Smart, Helen F., and Brunstetter, R. C.: Spinach and Kale in Frozen Pack: I. Scalding Tests; II. Microbiological Studies, *Food Research* 2: 151, 1937.

11. Prescott, S. C., and Tanner, F. W.: Microbiology in Relation to Food Preservation, *Food Research* 3: 189 (Jan.-April) 1938.

12. Lochhead, A. G., and Jones, A. H.: Types of Bacteria Surviving in Frozen-Pack Vegetables, *Food Research* 3: 299 (May-June) 1938. Jones, A. H., and Lochhead, A. G.: A Study of Micrococci Surviving in Frozen-Pack Vegetables and Their Enterotoxigenic Properties, *ibid.* 4: 203 (March-April) 1939.

13. Fellers, C. R.: Public Health Aspects of Frozen Foods, *Am. J. Pub. Health* 22: 691 (June) 1932.

14. Berry, J. A.: Microbiology of the Frozen Pack, *Canning Age* 13: 251 (April) 1932.

15. Smart, Helen F.: Further Studies on Behavior of Micro-Organisms in Frozen Cultivated Blueberries, *Food Research* 4: 287 (May-June) 1937.

16. Wallace, G. I., and Park, S. E.: Microbiology of Frozen Foods: IV. Longevity of Certain Pathogenic Bacteria in Frozen Cherries and in Frozen Cherry Juice, *J. Infect. Dis.* 52: 146 (March-April) 1933; V. The Behavior of *Clostridium Botulinum* in Frozen Fruits and in Vegetables, *ibid.* 52: 150 (March-April) 1933.

17. Prescott, S. C., and Geer, L. P.: *Proc. Ann. Meet., Am. Inst. Refrigeration*, July 1937, p. 301.

18. Jenkins, R. R.; Tressler, D. K., and Fitzgerald, A. A.: Vitamins in Vegetables: Storage Temperatures for Frozen Vegetables, *Ice and Cold Industry* 41: 100, 1936.

19. Augustine, D. L.: Effects of Low Temperatures upon Encysted *Trichinella Spiralis*, *Am. J. Hyg.* 17: 697 (May) 1933.

20. Tressler, D. K.; Birdseye, C., and Murray, W. T.: Tenderness of Meat: I. Determination of Relative Tenderness of Cured and Quick-Frozen Beef, *Indust. & Engin. Chem.* 24: 242 (Feb.) 1932; Tressler, D. K., and Murray, W. T.: II. Determination of Period of Aging Grade A Beef Required to Produce a Tender Quick-Frozen Product, *ibid.* 24: 299 (Aug.) 1932.

21. Watson, V. K., and Fellers, C. R.: Nutritive Value of the Blue Crab (*Callinectes Sapidus*) and Sand Crab (*Philyrochelis*), *Trans. Am. Fisheries Soc.* 65: 342, 1935.

and the sand crab (*Platyonichus ocellatus latreille*) with negative results; and Louder and Smith,²² comparing frozen evaporated milk with that taken directly from the can, found that young rats during a twelve week period were in equally good health and made practically the same gains in body weight on the two.

EFFECT ON VITAMIN A VALUES

With regard to the effect of quick freezing on the vitamin A values of foods, only a few investigations have been reported in which direct comparison of the same material fresh and frozen has been made, but comparisons of the values reported in the literature for a number of fresh fruits and vegetables with those found by Fitzgerald and Fellers²³ for other samples of these same foods which had been quick-frozen indicate little if any loss of the vitamin as a result of subjection to the quick freezing process. Bio-assays of vitamin A in samples of fresh and frozen spinach which were not identical but of strictly comparable origin made by DeFelice and Fellers²⁴ showed that the fresh spinach contained an average of 680 international units per gram as compared with 576 for frozen, and no further loss occurred in the latter after storage for three months at -17.8°C . (0°F). Stimson, Tressler and Maynard²⁵ have studied the carotene content of Thomas Laxton peas at various stages in their preparation for quick freezing and find that vining, blanching, washing and sorting by brine cause little or no loss of carotene, nor was there loss in storage for eleven months at -40°C . (-40°F). However, at -17.8°C . (0°F .) graded samples showed at this time a loss of 7 per cent and ungraded of 26 per cent. Todhunter,²⁶ who has determined the vitamin A value of Telephone peas preserved by the frozen pack method, finds no difference in peas scalded at different temperatures and for varying periods of time before freezing. The average vitamin A value for three varieties of peas (Telephone, Tall Alderman and Dwarf Alderman) preserved by quick freezing she found to be 10 international units per gram.

EFFECT ON VITAMIN B₁ (THIAMIN) VALUES

Losses in vitamin B₁ (thiamin) content of quick-frozen foods are due to the preliminary blanching or to cooking for the table rather than to the refrigeration. Thus Rose and Phipard²⁷ found no loss of vitamin B₁ in frozen peas as compared with the same peas fresh and uncooked, but there was a loss of 26 per cent brought about by cooking fifteen minutes, no cooking water being discarded. An even greater loss in short time cooking has been reported by Munsell and Kifer,²⁸ namely a depreciation of 50 per cent in cooking broccoli for fifteen minutes. Fellers, Esselen and Fitzgerald²⁹

have reported practically no loss of vitamin B₁ in frozen peas and little in spinach (8 per cent), but in the case of lima beans and asparagus the differences between fresh and frozen averaged 54 and 26 per cent respectively. The order of loss appears to vary with the blanching time, indicating again that cooking rather than freezing is responsible for the change.

EFFECT ON VITAMIN G (RIBOFLAVIN) VALUES

The vitamin G (riboflavin) content of only a few foods has been investigated and in these little or no loss due to freezing per se has been discovered. Rose and Phipard²⁷ compared quick-frozen peas and lima beans with the same season's crop in the fresh state and found no change due to freezing or to cooking. Fellers, Esselen and Fitzgerald²⁹ also found no loss in quick-frozen peas but reported a 16 per cent decrease in the vitamin G content of lima beans. Slight losses were also observed by them in asparagus and spinach, amounting to 5 and 9 per cent respectively. Canning proved much more destructive of vitamin G than freezing in the case of asparagus, lima beans and spinach, in which the losses amounted to 22, 27 and 62 per cent respectively.

EFFECT ON VITAMIN C (ASCORBIC ACID) VALUES

The widely recognized danger of loss of vitamin C (ascorbic acid) from fruits and vegetables, especially through heating and aging, has led to considerable investigation with regard to the vitamin C content of quick-frozen foods. It is now well established that the antiscorbutic value of the citrous fruits is little affected by storage for long periods at low temperatures. As early as 1925 Delf³⁰ showed that both orange and lemon juice stored approximately one and a half years at temperatures of from -11.0°C . (12.2°F .) to -14.0°C . (6.8°F .) were equal in vitamin C value to the original fresh material. Similar results were found by Conn and Johnson,³¹ by Nelson and Mottern,³² and by Buskirk, Bacon, Tourtellotte and Fine.³³ The last named group compared fresh orange juice with quick-frozen juice after storage from six to twenty months and found the vitamin C potency of the two essentially the same.

The effect of storage at low temperature on quick-frozen blueberries, cranberries, strawberries and the juice of black currants has also been investigated. Fellers and Isham³⁴ found that quick freezing did not appreciably injure vitamin C in high bush blueberries (*Vaccinium corymbosum*), but according to Merriam and Fellers³⁵ defrosting and refreezing destroyed practically all of the vitamin present in the fresh fruit. The juice of the black currant (*Ribes nigrum*), as reported by Daniel and Munsell,³⁶ had the same value when fresh and when stored for two months at -10°C . (14°F .). Cranberries, frozen whole, sliced or crushed,

22. Louder, E. A. and Smith, L. S.: The Food Value of Frozen Evaporated Milk, *J. Dairy Sci.* **15**: 113 (March) 1932.

23. Fitzgerald, G. A., and Fellers, C. R.: Carotene and Ascorbic Acid Content of Fresh Market and Commercially Frozen Fruits and Vegetables, *Food Research* **3**: 109 (Jan-April) 1938.

24. DeFelice, D., and Fellers, C. R.: Carotene Content of Fresh, Frozen, Canned and Dehydrated Spinach, *Proc. Am. Horticult. Soc.* **35**: 728, 1938.

25. Stimson, C. R.; Tressler, D. K., and Maynard, L. A.: Carotene (Vitamin A) Content of Fresh and Frosted Peas, *Food Research* **4**: 475 (Sept.-Oct.) 1939.

26. Todhunter, Elizabeth N.: Personal communication to the author.

27. Rose, Mary S., and Phipard, Esther H. F.: Vitamin B and G Values of Peas and Lima Beans Under Various Conditions, *J. Nutrition* **14**: 55 (July 10) 1937.

28. Munsell, Hazel E., and Kifer, H. B.: The Vitamin B and G Content of Raw and Cooked Broccoli, *J. Home Econ.* **24**: 823 (Sept.) 1932.

29. Fellers, C. R.; Esselen, W. B., Jr., and Fitzgerald, G. A.: The Vitamin B₁ and Vitamin B₂ (G) Content of Vegetables as Influenced by Quick Freezing and Canning, *Contribution 235*, Massachusetts Agricultural College, Agricultural Experiment Station, 1938; see also *Quick-Frozen Foods Magazine*, March 1939.

30. Delf, E. M.: Influence of Storage on the Antiscorbutic Value of Fruits and Vegetable Juices, *Biochem. J.* **19**: 141, 1925.

31. Conn, Lillian W., and Johnson, A. H.: Vitamin C Content of Frozen Orange and Grapefruit Juices, *Indust. & Engin. Chem.* **25**: 218 (Feb.) 1933.

32. Nelson, E. M., and Mottern, H. H.: Vitamin C Content of Frozen Orange Juice, *Indust. & Engin. Chem.* **25**: 216 (Feb.) 1933.

33. Buskirk, H. H.; Bacon, W. E.; Tourtellotte, D., and Fine, M. S.: Stability of Vitamin C in Frozen Orange Juice During Prolonged Storage, *Indust. & Engin. Chem.* **25**: 808 (July) 1933.

34. Fellers, C. R., and Isham, P. D.: Vitamins C and A in Blueberries, *J. Agric. Research* **47**: 163 (Aug. 1) 1933.

35. Merriam, O. A., and Fellers, C. R.: Composition and Nutritive Studies on Blueberries, *Food Research* **1**: 501 (Nov.-Dec.) 1936.

36. Daniel, Esther P., and Munsell, Hazel E.: Vitamin Content of Foods, Miscellaneous Publication 275, United States Dept. of Agriculture, 1937, p. 56.

were equally rich in the vitamin after storage for nine months at from -17.8°C . (0°F .) to -26°C . (-15°F .)³⁷ and so were strawberries, frozen with or without sugar, and stored in 1 pound wax paper cartons at -17.8°C . (0°F .) from four to seven months (Fellers and Mack³⁸).

The study of vitamin C values of vegetables is beset with many difficulties. There is variability due to soil and climate; also to age and time between gathering and processing, a period during which temperature and care in handling are factors of prime importance. In case of seeds such as peas and beans there is also variability associated with seed size (Tressler, Mack, Jenkins and King³⁹). A study of vegetables in the Boston market by Feener, Palmer and Fitzgerald⁴⁰ in 1937 indicated that the only green vegetables available during the winter and spring are those shipped from regions such as California, Texas, Florida and Mexico, which are from 6 to 12 days old when they arrive. In the summer months they come from nearby farms and arrive at the markets with much less delay. Vitamin C tests on spinach, broccoli, green beans and peas made weekly for one year and on asparagus for the five months in which it was available showed that all of these vegetables except the green beans contained more vitamin C during the winter months, or when otherwise protected by refrigeration, than during the warm season, when the market supply came from local sources. Rated in order of potency as received were broccoli, spinach, asparagus, green beans and peas. The degree of retention during marketing, however, was in the order of peas, beans, asparagus, broccoli and spinach. That simply cooling with ice is not sufficient to protect the vitamin C was shown by Fellers and Stepat,⁴¹ who found that peas freshly picked and shelled and then shipped to Amherst, Mass., from Bridgeton, N. J., or Albion, N. Y., in iced half-bushel hamper lost 51 per cent of their vitamin C content after twenty-four to forty-eight hours, although on arrival they were immediately placed in cold storage at 1.7°C . (35°F .). Lima beans stored in the pod in open containers retained their vitamin C value remarkably well, the loss in three varieties after seven days of storage at 0°C . (32°F .), amounting to 11, 22 and 30 per cent respectively and at 24.8°C . (76.6°F .) to 16, 32 and 56 per cent. However, the same beans shelled and kept in moisture proof containers lost their vitamin C approximately twice as rapidly as the unshelled beans (Tressler, Mack, Jenkins and King³⁹). Corn in the husk shipped in ice and requiring from one to two days for transmission loses but little vitamin C (Dunker, Fellers and Fitzgerald⁴²) and can be stored at room temperature for twenty-four hours with less than 10 per cent loss. In four days of such storage, however, the loss may amount to about 50 per cent.

Practically every factor that detracts from quality also lessens the vitamin C content of vegetables. For example, the crushing and bruising of the leaves in handling spinach may cause losses as high as 60 per cent (Fitzgerald⁴³) and the holding of fresh peas at room temperature for three days may result in a 50 per cent loss of the vitamin (Mack, Tressler and King⁴⁴). Fitzgerald⁴³ sums these factors up as follows: "Variety, over-maturity, soil and growing conditions, holding between harvesting and blanching, lack of quick cooling following blanching, holding between blanching and freezing, storage and/or transportation at too high temperatures, and finally overcooking all detract from quality and vitamin C potency of quick frozen vegetables."

Speed is essential between harvesting and blanching because ascorbic acid oxidase is then causing loss of ascorbic acid. It is also essential in cooling, for, if all oxidizing enzymes are not inactivated by blanching, further changes will take place before the temperature of the product is sufficiently reduced to check them. In some foods the arrest of enzyme activity by blanching is necessarily incomplete because full destruction would give a product of less desirable character. Direct oxidation in air also tends to cause vitamin C loss, so that expedition between blanching and freezing becomes of utmost importance. A further source of difficulty is that excess contact with water in blanching, cooling and sorting tends to leach out soluble materials. This is shown strikingly in case of vitamin C in spinach, in which the loss during processing as reported by Dunker and Fellers⁴⁵ averaged about 45 per cent. Todhunter and Sparling⁴⁶ investigated the ascorbic acid content of peas of the Telephone variety scalded at different temperatures and for varying periods of time before freezing and found no difference in the values for peas scalded for one minute in steam or in water at 99°C . (210.2°F .), but scalding in water for three minutes at this temperature or for two, four and six minutes at 71°C . (159.8°F .) resulted in a significant loss. Later Todhunter,⁴⁶ testing three sizes of Tall Alderman peas after scalding and before freezing, found losses of 40, 34 and 33 per cent respectively in three different sizes, the smallest peas showing the greatest loss.

According to Kertesz, Dearborn and Mack,⁴⁷ ascorbic acid oxidase is completely inactivated in vegetables or in their extracts by heating to 100°C . (212°F .) for one minute. Peas frozen after sufficient heat treatment to inactivate their ascorbic acid oxidase retain a much greater portion of their original ascorbic acid than those having the active enzyme present. Similar results were obtained by Jenkins, Tressler and Fitzgerald,⁴⁸ who analyzed the factors responsible for the loss of vitamin C during commercial freezing. They found that of a total loss approximating 30 per cent when there were no delays in processing, 10 per cent was attributable to

37. Isham, P. D., and Fellers, C. R.: Effect of Manufacturing and Preserving Processes on the Vitamins of Cranberries, Bulletin 296, Massachusetts Agricultural College, Agricultural Experiment Station, 1933.

38. Fellers, C. R., and Mack, M. J.: Vitamin C in Frozen Strawberries and in Strawberry Ice Cream, *Indust. & Engin. Chem.* **25**: 1051 (Sept.) 1933.

39. Tressler, D. K.; Mack, G. L.; Jenkins, R. R., and King, C. G.: Vitamin C in Vegetables: VII. Lima Beans, *Food Research* **2**: 175, 1937.

40. Feener, S. L.; Palmer, V. W., and Fitzgerald, G. A.: Seasonal Variations in Vitamin C Content of Fresh Market Vegetables, *J. Am. Soc. Refrigerating Engineers* **33-34**: 101 (Aug.) 1937.

41. Fellers, C. R., and Stepat, W.: Effect of Shipping, Freezing and Canning on the Ascorbic Acid (Vitamin C) Content of Peas, *Proc. Am. Horticult. Soc.* **53**: 627, 1936.

42. Dunker, C. F.; Fellers, C. R., and Fitzgerald, G. A.: Stability of Vitamin C in Sweet Corn to Shipping, Freezing and Canning, *Food Research* **2**: 41, 1937.

43. Fitzgerald, G. A.: The Effects of Freezing on the Vitamin Content of Vegetables: A Review, *Refrigerating Engineering* **37**: 33 (Jan.) 1933.

44. Mack, G. L.; Tressler, D. K., and King, C. G.: Vitamin C Content of Vegetables: II. Peas, *Food Research* **1**: 231 (May-June) 1935.

45. Dunker, C. F., and Fellers, C. R.: Vitamin C Content of Spinach, Contribution 271, Massachusetts Agricultural College, Agricultural Experiment Station, 1939.

46. Todhunter, Elizabeth N., and Sparling, B. L.: Vitamin Values of Garden Type Peas Preserved by Frozen Pack Method: I. Ascorbic Acid (Vitamin C), *Food Research* **3**: 489 (Sept.-Oct.) 1932.

47. Kertesz, Z. L.; Dearborn, R. B., and Mack, G. L.: Vitamin C in Vegetables: IV. Ascorbic Acid Oxidase, *J. Biol. Chem.* **110**: 717 (1936).

48. Jenkins, R. R.; Tressler, D. K., and Fitzgerald, G. A.: Vitamin C Content of Vegetables: VIII. Frozen Peas, *Food Research* **3**: 133 (April) 1935.

blanching and the remainder to cooling and washing operations subsequent to blanching. It is desirable to have the blanching time as short as is compatible with a first class product. In the case of lima beans, Tressler, Mack, Jenkins and King³⁹ found that with a blanching period of 150 seconds there was a loss of from 32 to 40 per cent of the ascorbic acid, but with the time shortened to forty-five seconds only 23 per cent was destroyed. In blanching artichoke hearts there is no loss of vitamin C when the material is treated for from seven to nine minutes (Joslyn, Bedford and Marsh⁴⁰), this time being sufficient to destroy the ascorbic acid oxidase.

The influence of thawing on ascorbic acid value seems to depend primarily on the efficiency of the blanching in destroying ascorbic acid oxidase. Jenkins and his associates⁴⁸ reported no loss of vitamin C due to thawing per se, and Fenton and Tressler⁵⁰ kept certain samples of frosted peas at room temperature from one to five hours and other samples in a refrigerator at 4.4 C. (40 F.) for sixteen hours without vitamin C loss, when they had been blanched for sixty seconds in boiling water or for 120 seconds in steam.

On the other hand, Todhunter and Sparling⁴⁶ found that thawed peas removed from the original hermetically sealed containers and allowed to stand at room temperature lost 16 per cent of their ascorbic acid in thirty minutes and 27 per cent in one hour, while on standing twenty-four hours in a refrigerator at 4.4 C. (40 F.) the loss was 25 per cent. In the case of sweet corn (Dunker, Fellers and Fitzgerald⁴²) the loss due to thawing is very slight, being less than 5 per cent after defrosting twenty-four hours.

Any possibility of loss by thawing can be avoided by cooking without defrosting. It is usually recommended that peas be transferred while still solidly frozen to a pan containing boiling water and cooked till tender, usually not over ten minutes. If a small quantity of water is used the vitamins soluble in water will be better conserved. Fenton and Tressler⁵⁰ found that only 5 to 15 per cent of the vitamin C was actually destroyed but that 33 to 53 per cent had gone into solution in the cooking water. Roberts⁵¹ has also reported the loss due to solubility in the cooking water as being the greater part of the loss in cooking.

SUMMARY

Quick freezing is a mode of food preservation which affords the consumer fresh material, free from inedible waste and held in cold storage until delivery. Good quality, freshness, sanitary care, subjection to low temperatures as speedily as possible, holding at -17.8 C. (0 F.) or lower while in storage, in an airtight water-proof package, and maintenance in the frozen condition until time of using are essential conditions for producing safe foods of the highest possible nutritive value.

The number of micro-organisms in foods is greatly reduced by quick freezing. Extensive studies indicate that there is little danger from foods frozen and held in storage at temperatures below 32 F., but on thawing the organisms increase rapidly; hence

frosted foods should be cooked without thawing or very soon afterward. Refreezing of products once defrosted is not safe.

Vitamin A values in foods are conserved by storage at low temperature, out of contact with light, in a practically impervious package, conditions which should prevail in the case of quick-frozen foods until delivery to the consumer. No loss of this vitamin has been observed in samples of peas held in storage for as long as eleven months at -40 C. (-40 F.).

Vitamin B₁ (thiamin) is not affected by the freezing per se but considerable loss may occur in the blanching of vegetables which have a tendency to lose vitamin B₁ in cooking. Some of these are lima beans and broccoli, in which reported losses are approximately 50 per cent and asparagus and peas, in which they amount to about 25 per cent. To conserve vitamin B₁ in quick-frozen vegetables, the blanching time should be as short as is compatible with a product satisfactory in other respects.

Little if any loss of vitamin G (riboflavin) has been observed in the quick-frozen vegetables investigated, viz. peas, lima beans, asparagus and spinach. Whatever slight loss has occurred (from 5 to 16 per cent) has been due to blanching and not to the actual freezing.

Vitamin C (ascorbic acid) in fruits appears to be conserved by quick freezing and storage at low temperatures, as shown by results with strawberries, cranberries, blueberries and the juices of the citrous fruits and of black currants. In the case of blueberries, however, defrosting and refreezing almost completely destroy the small amount of ascorbic acid which is present.

The vitamin C value of quick-frozen vegetables depends on many factors: 1. Variability in the fresh material, due to botanic variety, soil, climate, age and, in case of peas and beans, seed size. 2. Conditions between harvesting and freezing, including time in transportation, manner of packing for shipment, and temperature during shipment and while held in the market prior to processing. Thus fresh peas when shelled and packed in iced hampers may lose as much as 50 per cent of their vitamin C content if the time required for transportation is from twenty-four to forty-eight hours. 3. Blanching, cooling and holding before freezing. Speed is essential between harvesting and blanching to destroy ascorbic acid oxidase. Time, temperature and contact with water in blanching and cooling all affect vitamin C values. Minimum loss of ascorbic acid is attained when the blanching period is just sufficient to inactivate ascorbic acid oxidase and the product is cooled with all possible speed.

Loss of vitamin C in thawing takes place slowly. The final result depends partly on the completeness of the destruction of the ascorbic acid oxidase in blanching and partly on the conditions under which the food is allowed to thaw. Thus in case of frosted peas the loss may amount to as much as 25 per cent if they stand at room temperature for one hour or in a refrigerator at 4.4 C. (40 F.) for twenty-four hours. Loss in thawing can be avoided by cooking without defrosting. With careful control at all stages, the loss of vitamin C may be no more than the loss in cooking the fresh material. This has been found to be the case with peas. Loss in storage should not occur if the temperature does not rise above -17.8 C. (0 F.)

39. Joslyn, M. A.; Bedford, C. L., and Marsh, G. L.: *Enzyme Activity in Frozen Vegetables: Artichoke Hearts*, Indust. & Engin. Chem. **30**: 1068 (Sept.) 1938.

50. Fenton, Faith, and Tressler, D. K.: *Losses of Vitamin C During Commercial Freezing, Defrosting, and Cooking of Frosted Peas*, Food Research **3**: 409 (July-Aug.) 1938.

51. Roberts, V.: *A Study of the Effect of Different Methods of Cooking on the Vitamin C Content of Frosted Peas*, J. Home Econ. **30**: 582 (Oct.) 1938.

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2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

OBITUARIES OF PHYSICIANS PUBLISHED IN 1939

The number of obituaries of physicians published in THE JOURNAL during 1939 was 3,879, of which 3,710 were of the United States and 169 of Canada. Three died in Hawaii, three in China, two each in France and the Philippine Islands, and one each in the British West Indies, Canal Zone, Egypt, Germany, Mexico, Persia and Puerto Rico. The obituaries of 116 women physicians were published, as compared with 108 in 1938. The number of graduates of medical schools in the United States for the fiscal year ended June 30, 1939, was 5,089. Deducting the number of physicians whose obituaries were published, there was a net addition to the profession for the year of 1,379, not including physicians coming to the United States from abroad.

Ages.—The average age at death of those classified as of the United States was 66.1, as compared with 65.6 in 1938. Thirty-five physicians died between the

ages of 25 and 29, forty-four between 30 and 34, sixty-five between 35 and 39, 115 between 40 and 44, 148 between 45 and 49, 219 between 50 and 54, 378 between 55 and 59, 529 between 60 and 64, 632 between 65 and 69, 569 between 70 and 74, 459 between 75 and 79, 323 between 80 and 84, 140 between 85 and 89, fifty between 90 and 95, and three were 95 or over. One was 166 years old.

Causes.—Heart disease was again the leading cause of death, as it has been for many years. Some contributory causes are also included in THE JOURNAL's tabulation as they have been in former years. For example, when a report of the cause of death gave chronic nephritis and heart disease, it was published as such in THE JOURNAL and was reported on the statistical charts under both diseases. Thus heart disease was reported as a cause of death in 1,585 cases. Endocarditis or myocarditis was specified in 373 cases, coronary thrombosis in 358, coronary occlusion in 246, angina pectoris in 72 and pericarditis in 3. Other diseases of the heart caused 534 deaths. Arteriosclerosis was the second most frequent cause, with 453. Pneumonia was the third most frequent cause with 370 deaths, of which 120 were specified as bronchopneumonia. Fourth on the list was cerebral hemorrhage with 368 deaths; 20 additional deaths were reported as due to paralysis. Of 357 deaths reported as due to cancer, the prostate gland was reported affected in 62 cases, the stomach and liver in 60, the intestine in 38 and the female genital organs in 2; in 195 cases the part affected was not specified. Nephritis was reported as the cause of 174 deaths. The number of cases in which hypertension was reported was 144, embolism and thrombosis exclusive of coronary thrombosis 113, uremia 94, other diseases of the urinary system 65, diabetes 91, diseases of the prostate other than cancer 67, tuberculosis 60, other diseases of the respiratory system 13, senility 43, cirrhosis of the liver 40, other diseases of the liver 15, appendicitis 29, influenza 28, leukemia 24, septicemia and intestinal obstruction 22 each, ulcer of the stomach 20, other diseases of the stomach 4, peritonitis 19, cholecystitis 18, paralysis agitans 15, biliary calculi 14, arthritis and pernicious anemia 13 each, Hodgkin's disease and benign tumors 11 each, encephalitis and meningitis 9 each, abscess, asthma and brain tumor 8 each, aplastic anemia and hernia 7 each, bronchitis 6 each, aneurysm, empyema and streptococcal infection of the throat 5 each, cerebral softening, pleurisy and pulmonary infarct 4 each, cerebral sclerosis, erysipelas, esophageal varix, dementia paralytica, multiple myeloma, myasthenia gravis, osteomyelitis, otitis media and subarachnoid hemorrhage 3 each, and carbuncle, diphtheria, diverticulitis of the colon, emphysema, gas bacillus infection, pellagra, sinusitis, thrombo-angiitis obliterans and undulant fever 2 each. Other diseases causing one death each as reported were Addison's disease, amebic dysentery, amyotrophic lateral sclerosis, bacillary dysentery, cerebral anemia, cerebral atrophy, cerebral compression,

cerebral infarct, chronic ergotamine tartrate poisoning, dementia praecox, diverticulum of the bladder, ectopic pregnancy, furunculosis, granulocytopenia, heat prostration, heat stroke, hemochromatosis, herpes zoster, mastoiditis, multiple sclerosis, obstructive jaundice, osteitis, paralytic ileus, paratyphoid infection, polyneuritis, pulmonary fibrosis, pyloric stenosis, Raynaud's disease, ruptured aorta, ruptured gallbladder, scarlet fever, spinal sclerosis, thrombophlebitis, toxic goiter, typhoid, typhus and urethral stricture.

Accidental Deaths.—One hundred and fifty-nine physicians died as the result of accidents in 1939, compared with 155 in the previous year. Automobile accidents accounted for 76 deaths, falls 33, burns 8, drowning 7, carbon monoxide gas 5, shooting 5, airplane accidents 3, overdose of medicine 3, train accident 2, motorcycle accident, poison and explosion 1. In 9 cases unexplained fractures were given as causes of death. One physician died from injuries received when he fell from a horse, one fell down an elevator shaft, one was injured on a golf course and one was frozen to death.

Suicides and Homicides.—Suicide was the cause of 81 deaths of physicians in 1939. Bullet wounds accounted for 35 of these deaths, poison 11, carbon monoxide poisoning 8, hanging 6, incised wounds 5, stabbing 3, jumping 2 and drowning 1. In addition, there were five cases which could not be classified because of insufficient information, for which the following causes were given: shooting 2, overdose of narcotic 2 and poison 1. There were seven homicides.

Civil Positions.—Among the decedents were 239 physicians who were or had been teachers in medical schools, 459 who had served in the World War, 55 veterans of the Spanish-American War and 8 veterans of the Civil War. One hundred and seventy were or had been health officers, 122 members of boards of education, 85 members of boards of health and 27 members of state boards of medical examiners. There were 50 who were or had been coroners, 41 mayors, 36 members of state legislatures, 33 authors, 28 bank presidents, 16 members of city councils, 13 missionaries, 12 editors, 11 police surgeons, 6 pharmacists, 5 clergymen, 5 postmasters, 4 lawyers, 3 justices of the peace, 1 congressman, 1 dentist and 1 judge. There were 25 members or former members of the United States Public Health Service, 18 of the Veterans Administration, 11 of the United States Army Medical Corps, 10 of the United States Navy Medical Corps and 4 of the Indian Medical Service.

Association Officers.—Among those who died who were or had been officers of the American Medical Association were 3 presidents, 13 section officers and 5 members of councils. Thirty-eight members or former members of the House of Delegates died during the year. There were also 46 presidents or former presidents of state medical associations and 5 secretaries.

TRENDS IN MORTALITY FROM HEART DISEASE AMONG YOUNG PERSONS

The report by Hedley¹ on the mortality from heart disease among young persons in the United States merits attention, because it would seem to confirm occasional reports² in the literature of a downward trend in the mortality from heart disease among young people. The report is based on information abstracted from the official mortality statistics of the U. S. Bureau of the Census, and the data cover the death rates from heart disease among persons from 5 to 24 years of age. A study of the data reveals that in every section of the country and in every state in which statistics were obtained there was a decline in the mean annual death rate from heart disease in 1930-1936 as compared with 1922-1929. The decline was often considerable. Thus, in Massachusetts the decrease amounted to about 36 per cent, while in several states the decline was over 30 per cent. The data collected from thirty-six states and the District of Columbia show that in this territory the mean annual death rate per hundred thousand from heart disease for the age period studied was 14.9 during 1930-1936 as compared with 19.7 per hundred thousand during 1922-1929, a decline of 24.4 per cent. Owing to possible inaccuracies in estimations of population, the decline indicated may not actually be as great as it appears to be at present. In any event there was apparently a rather substantial actual decline in mortality from heart disease among persons from 5 to 24 years of age during the period covered in the report of Hedley.

Since at least 80 per cent of heart disease during this age period is of rheumatic origin, it is pointed out by Hedley that the data might also serve as an index of mortality from rheumatic heart disease. It then becomes evident that, although the ultimate cause of rheumatic heart disease is unknown, there has apparently been a reduction in mortality. It is not known, however, what particular factor may be responsible for this decline. There are a number of possibilities. Some factor in the changing diet of the American people may be responsible, or perhaps rheumatic fever is becoming milder. The possibility that the diagnosis and treatment of rheumatic fever may have improved to the extent that fewer cases of severe heart disease are developing and the fact that, in general, more careful attention is being given to general health problems of children are also factors which should be considered. Even the possibility that improved housing conditions might be responsible for this decline should not be overlooked. Certainly, attempts should be made to determine the reason for the apparent decline in mortality in heart disease among young persons, and every effort should be made to give further impetus to the decline.

1. Hedley, O. F.: Pub. Health Rep. 5-1: 2271 (Dec. 29) 1939.
2. Dublin, L. I., and Lotka, A. J.: Twenty-Five Years of Health Progress, Metropolitan Life Insurance Company, New York, 1937. Cohn, A. E., and Lingg, Claire: Am. Heart J. 9: 283 (Feb.) 1934.

While the reported decrease in mortality due to heart disease among young people is encouraging, one should remain fully aware of the seriousness of the problem. Rheumatic heart disease, which for example caused more deaths among persons under 20 years of age in Philadelphia during 1936 than whooping cough, measles, diphtheria, scarlet fever, meningococcic meningitis and anterior poliomyelitis combined during this age period,³ continues to be particularly worthy of attention.

Current Comment

THE REVISED CAPPER-EPSTEIN HEALTH INSURANCE BILL

And now comes still another edition of the health insurance bill sponsored by the American Association for Social Security through Mr. Abraham Epstein. Again this perennial was introduced in the Senate, March 25, as S. 3660, by Senator Capper, of Kansas, who has sponsored practically all previous editions. The present bill proposes a federal appropriation of \$50,000,000 for the fiscal year ending June 30, 1941, and thereafter as much as may be necessary, to induce the states to embark on a combined program of compulsory and voluntary health insurance. The Social Security Board must approve all state plans. Exempted from the compulsory features of any state plan, it is proposed, will be those engaged in agricultural labor, in domestic service for an employer having less than three employees engaged in such service, and services performed by a minor who is actually in regular attendance during the day time as a student in an institution of learning. Plans must provide for cash benefits for loss due to disability and for medical benefits. The fund out of which benefits are to be payable is to be created and maintained by regular premiums paid by the state, employers and employees set according to wage classes, and by federal donations. The amount of the cash benefit to be paid an individual must be fixed according to the wage class of the individual and according to the number of his dependents. The administration of a state plan must be lodged in a central state board, a state commissioner of health insurance and a statewide system of local councils and local administrative offices. Medical benefits must be supplied to employees coming within the scope of the scheme and to their dependents. Local councils will prepare and publish lists of physicians, dentists, nurses and others who have previously agreed or with whom arrangements have been made to furnish medical benefits, and an employee will be permitted to select from such list the general medical practitioner and the general dental practitioner or the group of such practitioners by whom he wishes to be treated. For services rendered under a state plan the physician, dentist or other person or institution rendering them will be paid according to the manner of remuneration decided on by the local council, which may be a salary system, a per capita system, a fee system or a special

arrangement with a group of practitioners. The federal government, the bill proposes, will contribute to any state that has an approved plan for health insurance an amount equal to one half of the total of the premiums required to be paid by a state, this part of the federal subsidy to be used exclusively for the supplying of benefits. In addition, the federal government will pay 5 per cent of the state premiums to be used for the paying of the cost of administration for administering the state plan or for benefits, or for both. The bill is pending in the Senate Committee on Education and Labor, along with the Wagner health bill, the Lodge health bill, the Wagner-George hospital construction bill, the Mead hospital construction bill and various and sundry others. This would seem to be the open season for weird efforts at plans and legislation to solve medical problems. If there is any fault inherent in any compulsory insurance system that is not present or even intensified in this new Epstein concoction, these weary eyes fail to detect its absence.

"SOCIALIZED MEDICINE" AS A SLOGAN

Advocates of social theories have learned that a slogan is worth a thousand words of argument and many volumes of facts in selling ideas. Thus the phrase "socialized medicine" is being urged in the attack on the private practice of medicine. The term is almost perfectly indefinite; it may mean almost anything in the field of medicine that the listener wants it to mean. Defined as properly used in the social sciences, the term can refer only to such medical services as can be helpfully applied to the whole population, are supported by public funds and are properly administered by public authorities. Illustrations would be confined largely to public health and institutional care. This is not, however, what is meant by those who use the slogan. Such services are not, of course, opposed by organized medicine. On the contrary, they have been created and are maintained largely by the organized medical profession. The "goods" which this slogan seeks to sell are really compulsory sickness insurance. This has been found difficult to sell under its original label. Like most quack remedies, it is advertised as a panacea with careful concealment of its actual content and little demonstration of tested results where applied. Many centuries of sad experience with medical panaceas have made physicians suspicious of social ones. Like medical cure-alls, the panacea of compulsory health insurance has failed to produce promised results. Panaceas and slogans are not needed to meet the difficulties in the distribution of the cost of medical care. Scientific unbiased studies and carefully controlled experimentation may help us find solutions for our varied problems. These are the means by which medicine has made such marvelous progress in the conquest of disease and death. These are the methods now being applied by the same profession to the economic problems of medicine. The more accurate description of "politicalized medicine" or "state managed medicine" should be substituted for the misleading slogan "socialized medicine"; this will help to clear the air for a sane discussion of present problems.

3. Hedley, O. F.: *Pub. Health Rep.* 52:1957 (Dec. 31) 1937.

ORGANIZATION SECTION

THE WAGNER-GEORGE-LEA BILL TO PROMOTE THE NATIONAL HEALTH AND WELFARE THROUGH APPROPRIATION OF FUNDS FOR THE CONSTRUCTION OF HOSPITALS

HEARINGS BEFORE THE SUBCOMMITTEE OF THE COMMITTEE ON EDUCATION AND LABOR, MARCH 18

PRESENT: SENATORS MURRAY, CHAIRMAN OF THE COMMITTEE; THOMAS OF UTAH, LAFOLLETTE OF WISCONSIN, ELLENDER OF LOUISIANA, TAFT OF OHIO, WAGNER OF NEW YORK AND GEORGE OF GEORGIA

Statement of Hon. Robert F. Wagner, Senator from the State of New York

Senator Wagner introduced into the record the bill itself, Senate 2330, and the message of the President. He stated that this is merely a modest beginning on a program tending toward a national health bill, now pending before the committee on which, he stated, it is expected the committee will present a report next year. In emphasizing the necessity for such a bill, he said that 40 per cent of the counties in the United States—inhabited by 17,000,000 people—do not have a single registered hospital or special hospital, public or private; also that only sixteen states meet sound professional standards of adequacy in respect to bed capacity in general hospitals, only twelve states in tuberculosis and only five or six in mental hospitals. For the country as a whole, said Senator Wagner, there is a deficiency of 360,000 hospital beds—most marked in rural and economically depressed areas. He emphasized his belief that in many areas hospital beds stand empty because the poor and the needy sick have not the money to pay for services which they require. Finally, he said, "Federal-state cooperation in a coordinated program to meet all these hospital needs, together with increased provision for public health, maternal and child health and general medical care, must await enactment of the bill which is pending before the committee and which I confidently expect will be reported next year."

Statement of Dr. Thomas Parran, Surgeon General of the United States Public Health Service

Dr. Parran, after introductory remarks, stated:

By requiring each community to donate the site, and through the use of relief labor, it is estimated that the charge per bed, or rather cost per bed, for a 100 bed hospital, for building and equipment, would amount to about \$1,500.

SENATOR TAFT: I didn't get that about relief labor.

DR. PARRAN: By the use of relief labor in connection with the construction of the hospitals.

SENATOR TAFT: Do you figure that would make it cheaper or more expensive?

DR. PARRAN: I do not think it would make it more expensive, and it will constitute a smaller charge against the appropriation which is authorized under this bill, since these hospitals will be constructed in the most depressed areas, and presumably they are the areas in which there will be a surplus or plenty of relief labor which can be used in their construction.

SENATOR MURRAY: The labor would be supplied by the WPA?

DR. PARRAN: It would be supplied by the WPA.

SENATOR MURRAY: And would not be included in the cost of the construction of the hospitals?

DR. PARRAN: That is correct.

SENATOR ELLENDER: What would it cost otherwise, Doctor?

DR. PARRAN: It is estimated that for a 100 bed hospital the cost of material will amount to about \$810 per bed, or \$81,000 for a 100 bed hospital; that there will be used approximately \$500 worth of relief labor per bed; that the cost of the equipment will be slightly less than \$500 per bed—which makes a total of about \$1,810 per bed if one includes the relief labor. Out of this appropriation for building and equipment, it is esti-

mated that a 100 bed hospital of fire-resistant construction can be constructed at, as I have said, \$1,500 a bed. Based on this estimate we would expect to provide between five and six thousand total beds. The President has talked in his message about fifty hospitals, averaging 100 beds each.

SENATOR TAFT: I am a little interested in this relief labor business. These hospitals are fireproof hospitals, aren't they, Dr. Parran?

DR. PARRAN: They will be, sir.

SENATOR TAFT: They will be made of concrete or brick?

DR. PARRAN: The Public Works Agency has done some very interesting work in connection with the preliminary plans.

SENATOR TAFT: Isn't there a prohibition against any building costing more than \$55,000, erected by the government with WPA labor?

DR. PARRAN: If the committee will refer to the bill under consideration, to section 7 at the top of page 6, beginning at line 6:

And the Federal Works Agency is further authorized to expend out of appropriations available to it, in accordance with the purposes thereof, such sums as may be necessary for the completion of the project, but without regard to specific limitations imposed on the use thereof.

That was designed to remove the \$55,000 maximum limit in the current relief bill, WPA bill.

SENATOR TAFT: It seems to me that is a very doubtful policy, because the Congress definitely determined that they didn't want to use WPA labor in competition with the existing building trades labor which is unemployed, which is also looking for work. You propose that that policy be changed now?

DR. PARRAN: The President, in his message, recommended directly that WPA labor be used in the construction of these hospitals.

SENATOR TAFT: But it is a change in the policy which Congress adopted last year after a very considerable battle on the subject?

DR. PARRAN: It was not my understanding that the WPA bill excludes permanent legislation, and that it is enacted from year to year.

SENATOR TAFT: Don't you think there would be very violent objection from the labor unions, for instance, that this construction is not to be done in the usual way by contract?

DR. PARRAN: I don't feel competent to answer that question, Senator Taft. I can say that the WPA has already built a considerable number of hospitals during each of the years of its existence. I have data which I should be glad to furnish the committee in connection with that.

SENATOR ELLENDER: Dr. Parran, assuming that WPA labor cannot be used, what do you estimate the cost per room of erecting these hospitals?

DR. PARRAN: The labor cost per room has been estimated by the Public Works Agency at \$500.

SENATOR ELLENDER: That is with relief labor?

DR. PARRAN: Yes, sir.

SENATOR ELLENDER: Now, assuming that you are not going to use relief labor?

DR. PARRAN: I would estimate approximately the same cost.

SENATOR ELLENDER: In other words, whether you use relief labor or not, it will cost about \$1,800 per room, equipped?

DR. PARRAN: For a 100 bed hospital. One must recall that as the number of beds is reduced the cost per bed goes up very much, because one needs to provide a central heating plant and an operating room and an x-ray room and a laboratory and other facilities, all of which constitute fixed charges. Then, to add another fifty beds, once you have provided those basic facilities, results in lowering very materially the unit cost per bed.

SENATOR TAFT: You think a 100 bed hospital is an economic unit for the requirements we have in mind here?

DR. PARRAN: It is, and in fact there will be some communities in which a fifty bed unit will be all that they need at the present time.

SENATOR TAFT: Does the plan contemplate the entire cost to be borne by the federal government without any local assistance whatever?

DR. PARRAN: It does so far as construction is concerned. It contemplates that the community will donate the site, a satisfactory site, will bring water supply and sewerage facilities to the ground, and that the community will maintain the hospital without any federal assistance. It should be borne in mind that the largest cost of a hospital is not the first cost. If one figures an average, the very low average of \$3 a day for the care of a patient, you can see that within two years, let us say, the cost of maintaining the bed equals the initial cost of construction.

SENATOR TAFT: Is there any plan at all for cooperative construction? Does it contemplate any possibility of cooperative construction with the locality or some private institution that may be providing hospital service?

DR. PARRAN: There would be nothing to prevent a community which now has a hospital too small for its needs, applying for an addition to that hospital, the government retaining title to that part of the hospital which it builds.

SENATOR TAFT: On Saturday I was in Marion, Va., and visited a hospital which I assume had about twenty-five beds. It was a privately organized hospital. It was supported partly with local aid. Now, they would like a larger hospital. They need more beds than twenty-five. Is there any way that they could get assistance from the federal government to expand that existing hospital instead of going in and building a brand new hospital?

DR. PARRAN: It should be possible, among other ways, as follows: The nonprofit hospital association which I assume owns it could donate the hospital to the public authorities responsible for the health and medical care in that area. The existing hospital, if it is satisfactory, could be added to. If it is not of fireproof construction, probably it could be utilized as a nurses' home and housing for the health department. Perhaps some of the laboratory service, outpatient clinic service or other service could be done there, while the new, modern, fireproof hospital could be constructed adjacent to it on the same site.

SENATOR TAFT: But that would contemplate the wiping out of the private institution and any further private cooperation in the building of the hospital?

DR. PARRAN: In the first place the bill contemplates that title to the property will rest in the federal government; secondly, that the local authorities, or local philanthropy, or local voluntary hospital, will contribute the site on which the federal hospital is to be built.

SENATOR TAFT: Do I understand this to be a federal hospital when you get through?

DR. PARRAN: Well, when the hospital is built the title will continue to reside in the people of the United States.

SENATOR TAFT: Isn't that a substantial departure from anything we have ever done in the way of general medical care for the poor that are not related in any way to the federal government, like veterans?

DR. PARRAN: It is a definitely different method of approach.

SENATOR TAFT: You mean it is a complete departure, don't you, from anything we have ever done before, to have the federal government own general hospitals for the care of the sick throughout the United States?

DR. PARRAN: So far as I know, that has never been done.

SENATOR TAFT: Do you see any necessity for that? If we are going to donate this to the locality, why shouldn't we donate

it to the local government as well? We are going to make them maintain it. What is the advantage of keeping the title in the United States?

DR. PARRAN: I think there are several advantages. In the first place, when the hospital is started in a community not previously served by hospitals, usually they have some birth pains and growing pains. The physicians frequently are not accustomed to working in hospitals; the problem of establishing new hospitals with proper standards is a very important one, and all the hospital authorities and public health authorities of the country with whom we have discussed this matter have emphasized and reiterated the need for insuring proper maintenance and proper care of patients in these hospitals. The bill, under section 6, subdivision (h), on page 5, provides that these hospitals, when completed, will be leased "to the applicant for an indefinite period, the consideration for such lease being the maintenance and operation of said hospital in accordance with the provisions of this act." And among other provisions of the act, the same paragraph, section (e), provides that the Surgeon General is authorized "To secure reports and to make inspections with respect to professional service and standards of maintenance of the hospitals," et cetera.

SENATOR TAFT: Well, now, my recollection of the Wagner Act is that there is no such provision there, that it is a direct grant in aid to localities who want to build hospitals.

DR. PARRAN: There is a direct grant in aid under the Wagner so-called national health bill for aiding localities in building hospitals. There is a provision in that bill also for a flat amount per bed per year during the first three years, in order to enable the hospital to get on its feet, and there is further provision that the care of the poor patient, similarly, would be aided with federal funds. So that bill does not go so far, in terms of total commitments against the federal Treasury per bed constructed, as does the other bill of Senator Wagner.

SENATOR TAFT: But this does establish or start to establish a federal hospital system which the other bill did not?

DR. PARRAN: It does start a system of federally owned hospitals. I think it fair to say that, in discussing this matter with the authorities in the field, the point has been raised that after a certain number of years it might be desirable to have these hospitals turned over to the communities once they have demonstrated their ability to maintain and operate them. That is a provision which this, or a later Congress, might consider. In fact, under existing law, by a roundabout way it would be possible to do it. That is, if any one of these hospitals in future years were declared to be surplus to the needs of the federal government. There are already in existence laws under which they could be disposed of, presumably at a nominal price, to communities which had demonstrated their ability to operate such hospitals.

SENATOR TAFT: Do you see any objection to providing at once that, if it maintains the hospital properly for three years, the community should have title to the hospital transferred to it?

DR. PARRAN: I should like to give some consideration to that before making definite answer. As I say, there is provision in the law now which would make it possible to convey the title of a hospital to the community.

SENATOR ELLENDER: Dr. Parran, on that point what would be the objection? Supposing the community is unable to take care of the hospital, what is the government going to do? Is the government going to furnish the facilities anyhow? Is that contemplated?

DR. PARRAN: An effort has been made to safeguard, so far as possible, against that contingency, under the provisions of the bill. In the first place, the applicant must be a responsible local authority. The applicant must give insurance to the Public Health Service that—and I quote section 3, beginning at line 19:

Said applications shall contain information necessary to establish the existence of need for hospitals, to give assurance acceptable to the Surgeon General that such hospitals will be made available under appropriate conditions to all groups of the population, will be maintained in good repair, and will be utilized in furnishing service of satisfactory quality in accordance with regulations hereinafter authorized to be prescribed.

And then, under section 5, among other duties of the Hospital Council, composed of outstanding experts in these matters, the council is authorized to review applications for hospitals in

accordance with the section I have just read, "and recommendation of such projects as in its opinion are needed, will be adequately maintained, and otherwise will fulfil the requirements of this act."

SENATOR ELLENDER: Have you any estimate of the cost of maintaining a 100 bed hospital per day?

DR. PARRAN: The total cost, or the cost to the local taxpayers?

SENATOR ELLENDER: The total cost per day to keep it in good shape and operate it.

DR. PARRAN: If the hospital is operating at capacity the cost would vary. I would guess, per bed, it would vary from three to four dollars per day.

SENATOR ELLENDER: So that in a community in which a hospital was located, averaging \$3 per bed, that would be \$300 per day; and assuming 300 days per year, that would make \$90,000 per year to maintain the hospital?

DR. PARRAN: Your arithmetic is correct, but one must recall that at present a considerable part of the income of general hospitals is derived from patients. For the United States as a whole, 62 per cent of all hospital income is derived from patients, 24 per cent from tax sources and 14 per cent from other sources.

SENATOR ELLENDER: Well, then it is contemplated to charge the patients for the use of the hospital?

DR. PARRAN: Presumably a patient who is able to pay would pay, and a patient who is unable to pay would be cared for through local tax funds or local philanthropic funds or otherwise.

SENATOR MURRAY: That system is in operation now in a good many hospitals in the country, is it not?

DR. PARRAN: It is a well established principle, Senator, of having public hospitals, especially in rural areas, available to the whole population, and patients paying in accordance with their ability to pay.

SENATOR MURRAY: I understand that this is not to be regarded as a very ambitious undertaking but is more in the nature of an experiment and would very likely be swallowed up in a national health measure when we finally come to enact a general national health program?

DR. PARRAN: This is frankly an experiment on a comparatively modest scale. If and when a complete national health program is enacted, it seems to me that this bill would be an integral part, would fit into, very definitely into, the whole national health program, as regards the providing of hospital facilities for rural and economically depressed areas. I said this is comparatively a modest program, for the following reason: In April of last year the Public Works Administration had before it, and had approved, hospital projects amounting in total cost to \$104,000,000, ten times the appropriation authorized for the first year under this bill. Those projects have not yet been constructed, they are still pending, because the PWA has no money to allot to them. These include 8,359 beds, or nearly 60 per cent, in mental hospitals and 678 beds in institutions for the aged, 1,309 beds in tuberculosis hospitals, 4,178 beds in general hospitals. One must recall, however, that most of these projects are rather large ones, city or state projects, in that the communities which have been the first to put up this money for the WPA have been those who had naturally gotten aid in the building of the hospitals without particular regard to the relative needs of that or some other community. In addition, the WPA has constructed 4,333 beds in general hospitals. During the past five years there has been an annual average of hospitals constructed of approximately 26,000 beds per year. In other words, that is the average of replacements and new hospital beds constructed on the average each year, while this will amount to about five or six thousand beds.

SENATOR MURRAY: This will just supplement what is already going on?

DR. PARRAN: This would amount to about 25 per cent of the expected total hospital construction cost in the country.

SENATOR TAFT: We have talked about localities, but why shouldn't this program be undertaken entirely in cooperation with the states? Why should we go into the state of Georgia and build a federal hospital? Why shouldn't we go to the state of Georgia and say "Would you like to cooperate? We will be

glad to furnish the money if you want to start a system of hospitals"? I can't understand the reason for a federal system of hospitals.

DR. PARRAN: Senator, these hospitals, contemplated under this act, would be built in communities which are just so poor that they just cannot, or at least up to now have been unable, to tax themselves for the construction of the hospitals.

SENATOR TAFT: But you are not asking them to construct anything. I am saying, even suppose you are going to give them 100 per cent, why can't you do it through the state, if the locality is poor? There is no state that wouldn't be prepared to administer a system of hospitals.

SENATOR MURRAY: Doesn't the bill as it stands, Doctor, contemplate the states taking part in these activities under the bill? Under section 3 it states:

States, counties, cities, other political subdivisions or parts thereof alone or in combination wishing to participate in the benefits contemplated by this act shall make application to the Surgeon General of the Public Health Service.

DR. PARRAN: That is quite right, Mr. Chairman, and also it is required under section 6 that the Surgeon General shall cooperate with state and local health and welfare authorities and professional agencies.

SENATOR TAFT: But all the state can say is "We are glad to have you come in and set up a system of federal hospitals." Why shouldn't the states say "We can run a system of hospitals but we are too poor, and we would like some assistance and money"? You are going to ask them to maintain it anyway. I can't understand the reason for a federally operated or a federally owned system of hospitals.

DR. PARRAN: It is primarily, the thinking back of this bill is primarily that with the inducement of providing a nice modern, little hospital in the community too poor to build it for itself, that that act in itself will encourage the community to provide good care in the hospital. As you know, Senator, in a country where there is no hospital, the kind of medicine that is practiced is "kitchen surgery," and it goes back to a generation ago.

SENATOR TAFT (interposing): But I am asking about states. If one of these hospitals were built it would not be for a county. One would cover six counties, say. Say that in Mississippi there is no law that permits six counties to get together and join in maintaining a hospital at a cost of \$90,000 a year, which is a considerable cost, possibly, for those counties. It seems to me that you must deal with the state of Mississippi and that state would be able to set up a system that would substantially guarantee the maintenance or else prove that the whole system would not work.

DR. PARRAN: We do expect to secure the endorsement of local projects, projects originating locally, the request originating locally, we expect to secure the endorsement of the appropriate state agency.

SENATOR TAFT: Well, in some cases nearly all the states run insane hospitals, and in Louisiana they run these general hospitals, don't they, Senator?

SENATOR ELLENDER: Six of them.

SENATOR TAFT: I can't see why the federal government has to step in. We may want to encourage the states to go ahead and set up a system of state hospitals and more or less indicate where they should be if they are to get federal money; but why should the federal government start some new project that has no relation to a federal activity?

DR. PARRAN: I see nothing unreasonable and no argument against the provisions of this bill just because it has never been done before.

SENATOR TAFT: Well, it seems to me you are stepping right over the states and a function that is clearly a state function. I am willing to admit the principle of federal aid of the states which may be poor, and that we may want to help them with money; but to step in and set up a federal hospital system seems to me absolutely in violation of the Constitution of the United States, and I don't see the slightest justification for it.

DR. PARRAN: I don't feel competent to comment on the constitutionality of the bill, Mr. Chairman. One should point out also that in addition to providing accommodations for bed

patients, just the bedding down of patients, these institutions would, in many instances, house the local health agency, the local health department, providing laboratory facilities for them, facilities for well baby clinics, venereal disease clinics, children's clinics and tuberculosis services, and so on. Among the other equipment there would of course be standard diagnostic laboratories, x-ray and various other equipment needed to enable the doctor to practice scientific medicine. One of the great troubles about health and medical care in the rural areas is that in those areas where there are not modern hospital facilities the young doctor, trained to use such facilities, hesitates to locate there; he goes to the city, which is already overcrowded. A young doctor may go into a rural area for a few years to get a little stake, and then he moves on to the city, leaving a disproportionate proportion of superannuated doctors in the rural areas, simply because the modern, well trained young medical graduate doesn't like to go out and practice "saddle-bag medicine" and "kitchen surgery." In other words, we look on these institutions as being health centers in the broadest sense. It should be noted that the bill is drafted so that the Advisory Council has a large share of responsibility, both as to the policies, as to the professional standards, and in general the administration of the act. The Surgeon General is authorized to do nothing until and unless he has consulted with the Council. A comparable device has proved very satisfactory in the administration of the National Cancer Institute Act, which also has a provision for an advisory council with which the administration of the act is shared. It should be noted that in the bill frequent reference is made to the quality of care, and in my view the necessity for insuring that quality of care is one of the most potent arguments for the federal government not to donate the hospital initially to the community. I think, Senator Taft, that consideration is probably one of the most important.

SENATOR TAFT: Why not donate it to the state, then, if they can't give it to the community?

DR. PARRAN: That is a question which might be considered, yet we are anxious not to have, shall I say, state competition, each state wanting to have proportionate part of such an appropriation. It seems to me that it is much more easy to get these hospitals located in the places where they are most needed.

SENATOR TAFT (interposing): You are going to have that competition anyway; you are going to have the same competition between states for these hospitals.

DR. PARRAN: Well, sir, I hope and firmly believe that it will be possible to locate these hospitals in those communities requesting them which need the hospitals the most.

SENATOR TAFT: I think you should certainly do so, but I am only saying that your argument about eliminating competition is not an answer to the question; you will have to resist that pressure, and no doubt you will.

SENATOR MURRAY: There will be an advisory board provided by the act, and they will have control of the proposition of where the hospitals are to be located.

DR. PARRAN: The function of the council is advisory, but they must review the various applications and they are authorized to recommend such projects as, in the opinion of the council, are needed and will be adequately maintained, and all of the responsibility of the Surgeon General is to be carried out only after conference with the Advisory Council.

SENATOR MURRAY: If the Advisory Council reported that it was not advisable to have a hospital in a certain locality where an application had been made, their advice would determine the matter?

DR. PARRAN: It would, so long as I would have anything to do with administering the act, Mr. Chairman, and I should think permanently, because none of us would like to see monuments to our own stupidity in terms of hospitals standing empty and not being maintained.

SENATOR MURRAY: You don't think that under this bill, then, hospitals would be built in sections of the country where they don't really need them and where they would be an idle investment?

DR. PARRAN: I have every confidence that they will be built only where they are urgently needed. May I give you just briefly a picture of the present situation regarding the hospitals in the country. There are 4,536 general hospitals admitted to registration by the American Medical Association. Nearly 600 of them are governmental, and nearly 2,500 are nonprofit, and nearly 1,500 of them are so-called proprietary.

SENATOR TAFT: What does that mean, do you mean owned by some doctor?

DR. PARRAN: Owned by a doctor or a profit-making corporation. Usually the proprietary hospitals are owned by individual physicians or groups of physicians. The reason why they have started the hospitals are plausible enough. Frequently a doctor wants to be a surgeon, or is a surgeon, and locates in a small town. He has no place to practice surgery. He buys an old residence, his wife is a nurse and helps to take care of the patients. First there are emergency cases, and as his reputation becomes enhanced other patients come to him. During these times many patients, not able to pay, come and ask for care. He can't, in conscience, turn them away. The result is that these proprietary hospitals frequently are really a millstone around the doctor's neck, but he has to bear that cost of doing surgery, otherwise it wouldn't be possible for him to do any surgery.

In general, the physicians who own these hospitals, especially where they are in poor physical shape and not fireproof, and so on, frequently are glad to see established a real community hospital in the broadest sense. Also some of these hospitals, most of them, have closed staffs. That means that only the doctors who are permitted by the owner to practice have any access to the hospital. If some other doctor wants to send a patient there, the patient immediately needs to be turned over to some member of the staff itself. That has acted as a deterrent to the practice of good medicine in some communities, although I wouldn't want to overemphasize that point. It would be assumed that in these public hospitals there would be assurance that all doctors eligible to practice medicine and surgery would be allowed to practice within the limits of their competence, not to practice surgery or do x-ray, but they would be eligible to practice general medicine, take care of general patients in these hospitals.

I have already given you information, I think, as to the distribution of costs of caring for patients in the hospitals. Now, on the average in the United States, there are 3.14 hospital beds per thousand of population, that is general hospitals, but that varies among the states from 4.58 in New York to Mississippi with 1.26, nearly four times as many, with relation to population, in New York as in Mississippi.

We have undertaken to divide the counties of the United States into hospital districts, or the whole United States, shall I say, into hospital districts. District 1, a first-class district, means satisfactory hospitals and large hospitals; district 2, not so well supplied with hospitals, but at the same time not urgently in need of them; the third-class district, or district 3, a hospital with a total of less than 100 beds, and finally district 4, with no beds whatever. Now, assuming that no hospitals were built in the first two areas, we find that there is a deficiency of about 250 hospitals, rural hospitals, hospitals that serve rural areas, totaling 17,500 beds, in what we call hospital districts 3 and 4, the worst districts.

Mr. Chairman, since some of the detailed statistics concerning the prevalence of the need for hospitals and the distribution or lack of hospitals by states were put into the hearings last year, with your permission I will not go into the details of that. I should like to tell you what the present situation seems to be, in terms of the requests which have come to us, and estimates which have been made by the state health officers. We have asked all the state health officers to give us a preliminary estimate as to the number of hospitals and the number of hospital beds which they think are needed in their states. In addition, voluntary requests, which seem to be substantial requests, have come in from 122 counties in thirty-eight states, estimating that they need 104 general hospitals, eleven tuberculosis hospitals and twenty-two special hospitals or alteration of existing ones.

With your permission I would like to give you also a summary of the estimates given by the state health officers. The state health officers estimate that there are needed a total of 251 hospitals, general hospitals, with total beds 14,255, that they need 101 tuberculosis hospitals with total beds 17,269 and five special hospitals with total beds 600.

One final word, if I may, about the tuberculosis problem. We have made estimates as to the number of tuberculosis hospitals, hospital beds rather, which are needed if we are to bring all the states not up to the standard of two beds per annual death, which is the accepted one, but just to bring them up to one bed per annual death, one half of that total, and it appears that we would need about 12,000 tuberculosis hospital beds for that purpose. It does occur to me that emphasis should be placed on the need for hospitalizing open cases of tuberculosis because of the infectious nature of the disease, and because of the fact that tuberculosis is on the decline in most parts of the country. Some states, and particularly certain areas in those states, still have a high rate, and I should like to see a very intensive attack on the tuberculosis problem. I am sure that the death rate can be reduced, can be accelerated very much over what we heretofore have done, if adequate tuberculosis hospital provisions are made in these states in which now the patients cannot get into beds.

SENATOR MURRAY: Applications for hospitals of that character would come from the states; they are state operated generally, are they not?

DR. PARRAN: Generally they are. Sometimes a large county or a tuberculosis hospital district would request one, but in general it is the state. The state health officers themselves seem to have emphasized that fact in their request for 101 such hospitals.

Mr. Chairman, that concludes the statement I have to make. I have been requested by a witness who had been invited to appear here, Dr. J. N. Baker, Alabama state health officer, to submit for the record two brief statements which he has prepared.

SENATOR MURRAY: Those will be incorporated in the record. [The statements referred to are as follows:]

Statement of Dr. J. N. Baker, Alabama State Health Officer

DR. BAKER: What of the residents of fifty-six counties in Alabama that do not maintain sanatoriums for tuberculosis? And what about the tuberculous residents of the eleven favored counties who cannot be admitted promptly because of the limited bed capacity of the relatively small institutions now in operation? Alabama, one of the two or three states having no state tuberculosis sanatoriums, is making excellent and effective use of the tuberculosis-treatment facilities at the service of her people, but the sad truth is that these facilities are woefully inadequate to deal with the tuberculosis problem as it should be dealt with.

Tuberculosis experts insist that any community—whether that be a township, a county, a state or a continent-spanning nation—should have at least one sanatorium bed for every annual death from this disease if it is really to come to grips with the problem of tuberculosis control. How sadly Alabama fails to do its full duty to its tuberculous is shown by the fact that, while more than 1,600 Alabamians died of this disease in 1938, the eight sanatoriums now in operation have a combined capacity of only 399 patients, or just about one fourth of the number regarded as adequate.

A partial survey of the Alabama hospital-care picture recently completed by the state department of health revealed that there were sixty-six general hospitals in this state, all of them situated in only thirty-eight of the state's sixty-seven counties. This total does not include specialized institutions, hospitals operated by the federal government, or small institutions which might be termed hospitals but which would be described more properly as emergency stations, because in most cases they are so poorly equipped and inadequately operated that they could hardly be expected to meet the standards set up for approval by either the American Medical Association or the State Hospital Association. Slightly more than three fifths of these sixty-six hospitals are operated as private institutions, which is to say that their primary purpose, laudable enough,

is to make money for the individuals and groups of individuals by whom they were established. Not quite one third are operated as nonprofit institutions. Only one out of every ten is operated either by a city or by a county or by these two governmental units together. Twenty-nine Alabama counties—slightly more than 43 per cent of the total—have no general hospitals to care for their sick. All but four of the twenty-nine hospital-less Alabama counties are 100 per cent rural, which is another way of saying that they contain no cities or incorporated towns having populations of 2,500 or more. In not a single county in this group does the urban population number as much as 50 per cent of the total.

DR. PARRAN: Also I have a series of tables showing the needs of hospitals by areas, which, with your permission, I would like to put into the record, and also a breakdown of the number of areas, number of counties, the population, the number and bed capacity of the hospitals in the hospital areas of the several classes which I have described. Finally, Mr. Chairman, I should like to call attention to a few items in connection with the bill itself. There are a small number of technical changes which the legal counsel of the agency now is considering and on which a report will be submitted. None of the amendments contemplated would change the purpose of the bill but would clarify the meaning in a few instances. With your permission I should like to support such amendments as will be suggested by the Agency. I hope, Mr. Chairman, that your committee will give favorable consideration to this legislation, which, to my mind, is a very sound next step in connection with the development of and promotion of the national health program.

SENATOR WAGNER: Doctor, have you, in the course of your discussion of this proposal, discussed it with any of the state officials, health officials, concerned with the problems of health in their respective states?

DR. PARRAN: We have, sir.

SENATOR WAGNER: And have they generally approved the provisions of the bill?

[At this point Dr. Parran introduced into the record letters received from health officers of various states, indicating the need for hospitals in those states. These letters follow:]

Excerpts of Letters from State Health Officers Pertaining to S. 3230

DR. J. N. BAKER, Alabama: There are only two general hospitals in Alabama which are entirely charitable institutions, one in Birmingham and the other in Mobile, with a combined bed capacity of 544 beds, or only 13.3 per cent of the total general hospital beds in the state. There are twenty-nine Alabama counties without a general hospital. In the United States as a whole the ratio of beds per thousand of population is 2.7. In Alabama this figure is reduced to 1.38. Tuberculosis experts insist that any community should have at least one sanatorium bed for every annual death from this disease. More than 1,600 Alabamians died last year of tuberculosis. The eight sanatoriums now in operation have a combined capacity of 399, one fourth the number regarded as adequate.

DR. COIT I. HUGHES, Arizona: Arizona has 731 beds for tuberculosis, exclusive of those in federal hospitals. Most of the sanatoriums and hospitals are private. There is no provision whatever for the thousands of low income and indigent cases which flow yearly into Arizona without provision for medical care, housing or nutritional needs. Public facilities are the State Sanatorium at Tempe, ninety beds; Pinal County Hospital, eight beds; Pima County Hospital, forty beds. Needed are two additional hospitals with approximately 400 additional beds available for free treatment or treatment at actual cost; 270 beds in Maricopa County (in addition to the existing facility), and 130 beds in Pima County. These are to be under state administration. No report on general hospitals is made.

DR. W. B. GRAYSON, Arkansas: Arkansas does not need any new hospitals constructed right at this time, with probably two or three exceptions. I suggest that any federal funds which may be available be utilized in providing the needy sick with hospitalization in well established existing institutions before any attempt is made to indulge in any vast building program with new hospitals. Maintenance of community hospitals in Arkansas would be impossible in many instances, and quite difficult in any instance. Tuberculosis construction now being completed will provide about 700 beds; 300 or 400 additional beds are needed.

DR. WALTER M. DICKIE, California: Roughly, I would estimate that fifteen or twenty small community hospitals, with a capacity of 1,500 beds, situated throughout the rural portions of the state, are needed in communities which have no facilities, or where present facilities are obsolete or inadequate.

DR. R. L. CLEERE, Colorado: An estimate of the needs of Colorado for additional hospitals would indicate the following: 1. In the areas of greatest need, hospitals of fifty-bed capacity would not be practicable, but from eight to twelve beds would be sufficient for existing needs. In these areas it would be most difficult to secure financial responsibility for the proper maintenance of the hospitals. The hospitals should serve as

he health centers for the particular area in which they are constructed and maintained. 2. Existing services rendered by maternity homes in many areas should be improved. 3. Special diagnostic facilities would be of assistance to practicing physicians in selected areas. 4. A district tuberculosis hospital in Grand Junction would probably be desirable, owing to inadequate facilities locally and the distance from the tuberculosis hospital centers. 5. Construction of a tuberculosis hospital in Denver or Pueblo, to render care to transient cases of tuberculosis, is worthy of consideration. 6. Full-time health services should be extended to sections of the state not now being served to insure success of health and medical programs. This objective should not be sacrificed to a program of hospital construction in isolated districts. The state has only one hospital specializing in maternity, fifteen specializing in tuberculosis, none of which are owned or operated by the state or local governments, and sixty-nine general hospitals. The greatest need in the state is indicated in the White and Yampa River valleys. In this district there are only five hospitals, the largest having twenty-one beds.

DR. STANLEY H. OSBORN, Connecticut: As a tentative and preliminary statement, the state of Connecticut does not need additional general hospitals but does need additional ward beds in urban community hospitals serving rural areas. It does need communicable disease beds in urban hospitals serving rural areas and it does need chronic beds throughout the state. For tuberculosis the state will need another 500 beds in the next five to ten years. This new institution might have a large surgical unit, as well as a medical unit, and would also be equipped to handle a fairly large outpatient service, which could be used for education, for a diagnostic center, for good after-care and also have facilities for a rehabilitation program.

DR. E. F. SMITH, Delaware: No comments.

DRS. A. B. MCCREARY, F. V. CHAFFELL and A. J. LOGIE, Florida: Owing to lack of population centers, we do not believe a general hospital of over fifty beds could be operated economically, if at all, in any part of western Florida. A hospital of fifty beds situated in Madison County, about two thirds of Taylor, at least one half of Jefferson, one half of Hamilton County, and one half of Suwanee County. There is a fairly thick center of population within 20 to 30 miles of Tallahassee which should easily support a fifty-bed hospital. Another large area of the state containing the population of between 40,000 and 45,000 persons would have as its center DeFuniak Springs in Walton County. The operation of a small hospital in either Apalachicola or Port St. Joe would be entirely feasible, as a result of the rapid growth of this coastal area. If we accept the American Public Health Association's standard of two beds for each death from tuberculosis, Florida requires a total of 1,800 beds for the care of her tuberculosis patients. Actually, the state lacks 1,400 of these beds. This shortage is even more acute so far as the Negro is concerned. There should be constructed two other institutions for the tuberculosis, each having a 500 bed capacity. One of these institutions should be situated near Tallahassee, which is approximately half way between Orlando and Pensacola. The other institution should be situated either near Fort Myers on the west coast or near West Palm Beach on the east coast. This would place the latter institution approximately half way between Orlando and Key West.

DR. T. F. ABERCROMBIE, Georgia: Sixty-three per cent of deaths from tuberculosis are of Negroes; 36 per cent of the population consists of Negroes; 26 per cent of tuberculosis beds are for Negroes. Nothing less than an equal number of beds for Negroes can be considered at all adequate; 491 additional tuberculosis beds are required. An immediate and extremely necessary requirement is a 200 bed tuberculosis hospital for Negroes. Three hundred additional beds are needed for the domiciliary care of Negro chronic incurable open cases.

DR. H. L. McMARTIN, Idaho: Lemhi County, the city of Salmon, with a population of approximately 2,500, has no hospital facilities of any kind available. It is doubtful whether the area could maintain a hospital without outside assistance. The most urgent need confronting the state of Idaho at the present time is that of providing adequate facilities for the hospitalization and treatment of tuberculous patients. Only two institutions exist, at Boise and Coeur d'Alene. One hundred deaths occur from tuberculosis annually. We are in immediate need of one tuberculosis hospital of at least 100 bed capacity. From 400 to 500 active cases in the state are predicted.

DR. A. C. BAXTER, Illinois: I cannot emphasize too strongly the serious need for approximately 700 tuberculosis sanatorium beds to serve the southern part of the state, which consists of forty-seven counties with an aggregate of about 1,400,000 inhabitants. Madison County is provided for satisfactorily. Alexander County recently opened a twenty bed sanatorium. St. Clair County has no construction; probably adequate facilities. It is recommended that six sanatoriums be constructed. There is a legally established and sound method of maintenance financing through the county tuberculosis sanatorium law which provides for the pooling of resources by several counties. Eighteen of forty-seven counties have already taken advantage of this law. Eleven counties have no hospital facilities of any kind. A general survey indicates a need for eight or ten new hospitals of fifty to 100 beds each.

DR. VERNE K. HARVEY, Indiana: Two general hospitals are requested in Benton and Hendricks counties. Southern Indiana probably needs additional hospital beds. The problem is one primarily of financing the present hospitals rather than the demand for additional hospitals. There is no community in the state at the present time that is farther than 30 miles from a hospital.

DR. WALTER L. BIERING, Iowa: While there are twenty-four counties without a general hospital, each is adjacent to one, two, three or four counties in which one or more general hospitals are located. Additional general hospitals are not an immediate need in Iowa at this time. There are five existing tuberculosis sanatoriums totaling 790 beds. There is not a single hospital for tuberculosis in the western half of the state. This need could best be served by locating a new hospital of 100 beds at Sioux City in Woodbury County. Several hospitals for acute infectious and contagious diseases are needed in the more populous areas of the state. The Des Moines area is mentioned.

DR. F. P. HELM, Kansas: The situation in Sedgwick County is acute. Sedgwick County Hospital is a fire trap and is not recognized by the American College of Surgeons. The county has 14,521 individuals

certified as eligible by the Sedgwick County welfare board. Beds in the present institution number seventy-five. They need replacement. No adequate quarters are available for the health department. There are at present, counting the new addition at Norton, approximately 250 tuberculosis sanatorium beds available in Kansas, leaving a deficit of 400 beds to meet minimum requirements.

DR. A. T. McCORMACK, Kentucky: There is a perfectly good state hospital for tuberculosis which has not been opened for two years because there is no money for its support. Facilities in themselves will accomplish nothing without sufficient assured income for their continued maintenance with competent and adequate personnel. A tentative recommendation is made for four general hospitals of fifty beds each and the addition of twenty beds to each of five existing hospitals. There are seventy-two general hospitals in fifty counties of Kentucky with 57 per cent occupancy. There are seventy counties without hospital facilities. To meet the demand for beds for tuberculosis in Kentucky, there needs to be provided either six hospitals with 250 beds each or three with 500 beds each.

DR. J. A. O'HARA, Louisiana: In Louisiana there are five general hospitals with a total of 4,475 beds. I think these can properly serve our population for the next few years to come. In addition to these there are two large hospitals at Jackson and Pineville for the incurable. There is imperative need for at least 1,000 more beds for tuberculous patients, located in the northern and southwestern sections to serve about one half of the state's population. Of course, the funds for maintenance would have to be considered. Facilities consist of the tuberculosis sanatorium at Greenwell Springs, 100 beds; beds are being secured for an additional 400 bed unit; and the Dibert Memorial in connection with the New Orleans Charity Hospital, 200 patients.

DR. ROSCOE L. MITCHELL, Maine: The general consensus seems to be that our state is now quite well supplied with hospitals in all sections where communities would be able to support them, and our three tuberculosis sanatoriums now seem to be able to take care of the load in that class of patients. The Arrostock General Hospital at Houlton, a converted wooden residence, of forty beds, not soundproof, desires a fireproof wing at an estimated cost of \$20,000.

DR. R. H. RILEY, Maryland: No report received.

DR. PAUL J. JAKMAUW, Massachusetts: There is no county in the state which is not served by one or more general hospitals. The adequacy of general hospital beds in Massachusetts is further indicated by a ratio of one hospital bed to 207 of population. Massachusetts has at last provided a sufficient number of tuberculosis sanatorium beds to care for actual needs. The ratio is approximately 2.7 beds per annual death. There is certainly no area in the state where any substantial increase in the number of hospital beds is warranted.

DR. H. ALLEN MOYER, Michigan: A general hospital in the central portion of the thumb district, population to be served about 65,000, a fifty bed hospital, is needed. Also a tuberculosis hospital at Houghton in the upper peninsula, a population to be served of 60,000, the aggregate number of beds from seventy-five to 100, to be a health center, housing a county health unit. I wish to submit to you the idea of establishing a state hospital limited to crippled children, to have a capacity of 100 to 150 beds, located in the central southern region of the state. A general hospital is needed at Charlotte, Eaton County; fifty beds are required, present facilities being inadequate. A general hospital at South Haven, Van Buren County, of fifty beds is required.

DR. A. J. CHESLEY, Minnesota: P. A. Surgeon Herman E. Hilleboe reports that there is no need for a general or a tuberculosis hospital, except replacements of inadequate fire traps to permit discontinuance of institutions of less than fifty bed capacity. Mr. A. M. Calvin, ex-director of the Minnesota Hospital Service Association, believes that the following places are in need of general hospitals and are quite a distance from any hospital in that area: Ely, thirty beds; Grand Marais, twenty-five beds; Baudette, twenty-five beds.

DR. FELIX J. UNDERWOOD, Mississippi: The state needs badly one 250 bed general hospital at Jackson, one 250 bed tuberculosis hospital for Negroes, one 250 bed hospital for chronic and incurable cases of tuberculosis, one large general hospital for Negroes in the Mississippi Delta and one 100 bed general hospital in north central Mississippi.

DR. HARRY F. PARKER, Missouri: The number of general hospitals needed is 110; the aggregate number of beds, 5,500. The population to be served numbers 1,500,000. Tuberculosis hospitals are needed of from five to 100 beds each.

DR. W. F. COGSWELL, Montana: The state of Montana is in urgent need of an addition to its tuberculosis sanatorium. An addition has been recently made to this sanatorium but it does not take care of all the patients who should be hospitalized. There are at the present time fifty patients on the waiting list. The sanatorium has 270 beds. A thirty bed hospital could be constructed at Circle, in McCone County.

DR. P. H. BARTHOLOMEW, Nebraska: As to construction of community hospitals in the more rural or sparsely settled areas, from present information I am unable to tender suggestions because of lack of reasonable assurance that any of such areas in this state are in an economic status that would warrant consideration of assuming the responsibility and cost of maintenance and continued operation. A 100 bed addition to the tuberculosis hospital is needed at Kearney, a 100 bed addition to the orthopedic hospital at Lincoln and a 100 bed addition to the University of Nebraska Hospital at Omaha.

DR. EDWARD E. HAMER, Nevada: The state is fairly well fitted up as far as general hospitals are concerned, but there is not a bed in the state for tuberculous patients. I believe that one hospital of 100 bed capacity would be sufficient to care for the tuberculosis cases in the state (population about 101,000).

DR. T. P. BURROUGHS, New Hampshire: It was the sense of the board that additional thorough general hospitals are not needed in New Hampshire and that there is no need for additional beds in New Hampshire for tuberculous patients and that some of the existing capacity of hospitals of New Hampshire could be helped by building necessary additions to existing facilities.

DR. J. LYNN MANAHEFF, New Jersey: There is a great need for the building of facilities for the care of the chronically ill and the convalescent. There is also a need for further expansion of facilities for

the care of the mentally ill, for the care of communicable diseases, for the development of a small tuberculosis sanatorium in the southern section of New Jersey, and one in the northern section.

DR. EDWIN B. GODFREY, New Mexico: One hospital, needed at Espanola to serve the southern part of Rio Arriba County, would also serve the northern part of Santa Fe County. The United Brethren of Christ might support. A hospital is needed at Albuquerque. Las Cruces, with a population of about 35,000, is interested in a hospital but I cannot see how the city of Las Cruces can finance a hospital. The state hospital at Socorro needs an additional wing.

DR. EDWARD S. GODFREY JR., New York: Schoharie County needs a fifty bed hospital at Cobleskill. Delaware County needs three small cottage type hospitals of thirty beds or so.

DR. PLUNKETT, New York: There is urgent need for at least 2,500 beds for tuberculosis cases in New York City. Erie County needs 200 additional tuberculosis beds.

DR. CARL V. REYNOLDS, North Carolina: Seven general hospitals and nine tuberculosis sanatoriums are needed, three of the latter being needed at the earliest possible time. There are thirty-eight of 100 counties in the state in which no hospital facilities are provided within the county. There are two sanatoriums for tuberculous patients already in existence and a third has been authorized, giving a total of 1,107 beds. The need could be estimated at 734 additional beds, provided either in county sanatoriums or tuberculosis wards of county homes. The nine sanatoriums requested should each have a capacity of approximately 250 beds.

DR. MAYSIL M. WILLIAMS, North Dakota: North Dakota does not need more hospitals at the present time. Only 65 per cent of the available beds have been used in the past five years. However, the state requires ambulance service of some type. There is an average of thirty-seven deaths a year in the approximately 10,000 Indian population as a result of tuberculosis. This would warrant some provision for hospitalization and isolation. However, there is some doubt as to whether state funds could be raised for the maintenance of a hospital of this kind.

DR. R. H. MARKWITH, Ohio: I think you will agree after studying the map that no one community is inaccessible to hospitals in Ohio.

DR. GRADY F. MATTHEWS, Oklahoma: The state of Oklahoma needs fifteen general hospitals of fifty beds in each. Not less than two and not more than five tuberculosis hospitals are required, with a total of about 1,400 beds.

DR. FREDERICK D. STRICKER, Oregon: The building of a hospital as a public health center would be of advantage and there are at least ten counties which could probably support a county hospital.

DR. JOHN J. SHAW, Pennsylvania: The general hospital beds per thousand of population in the United States and in Pennsylvania number 3.3. Ten counties in Pennsylvania have no general hospitals. Small hospitals of not over 100 beds may be the answer, provided maintenance can be guaranteed. This will be impracticable on the part of separate counties. Either grouping of counties for maintenance or state administration will be found necessary. The need is for more beds in existing institutions rather than more institutions for the beds. Twelve general hospitals are needed with 100 beds in each. No tuberculosis hospitals are needed at the present time. For economic administration, it is believed that these hospitals should be standardized with 100 beds each and that these be so constructed as to make of each a health center which will add greatly to the medical service of these communities in the field of preventive medicine and diagnosis. More satisfactory service will be obtained under state administration and maintenance without regard to county boundaries.

DR. LESTER J. ROUND, Rhode Island: There is need for 250 beds in tuberculosis sanatoriums. No general hospitals are required.

DR. JAMES A. HAYNE, South Carolina: Two general hospitals and tuberculosis accommodations are needed.

DR. J. F. D. COOK, South Dakota: We have many vacant beds in the general, private and church hospitals of the state. These vacant beds would be available and would meet the needs. However, owing to the low returns from agriculture, many of our people are unable to take advantage of these present available facilities in our hospitals. It is my opinion that the greatest need in South Dakota is hospital facilities for patients with acute pulmonary tuberculosis, since the present sanatorium is crowded and has a large waiting list. A 100 bed hospital is needed for the care and treatment of patients with acute pulmonary tuberculosis.

DR. W. C. WILLIAMS, Tennessee: There are forty-six counties in Tennessee without any known hospital facilities. There is no single county in this group that could provide maintenance for a hospital constructed in accordance with the President's proposal. The hope is that federal assistance might be made available not only for the construction of tuberculosis hospitals but for maintenance as well. One hospital for tuberculosis is needed in each grand division of the state with a minimum of 300 to 350 beds in each; likewise two or three general hospitals. Maintenance is not available. I suggest health centers for public health and outpatient medical services throughout the rural sections of the state. The extension of preventive measures and full utilization of present facilities will thus become more effective and efficient.

DR. GEORGE W. COX, Texas: Two tuberculosis hospitals of 1,000 beds each are needed. Exclusive of federal hospitals, Texas has a total of eighteen hospitals with a bed capacity of 2,116 for the care of tuberculosis only. A report from Dr. Charles W. Castner, chief, Eleemosynary Division, State Board of Control, as of Jan. 2, 1940, indicates a waiting list of fifty-seven white patients and fifty-eight colored patients. The state tuberculosis hospitals admit only patients who are classed as curable. The better plan would be to pay the existing facilities (physicians and hospitals) for medical care and hospitalization. The rate of pay for services could be based on the average charge for such services as are charged for like services in the communities in which these medical and hospital services are rendered. There are 390 hospitals in Texas having a bed capacity of 31,049, with 6,898 beds unoccupied. There are only two locations in Texas in which a person cannot be transported to a hospital within an hour's time, areas in East Texas and Southwest Texas.

DR. WILLIAM M. MCKAY, Utah: There are five rural areas in the state of Utah with limited economic resources where an urgent need for the establishment of a general hospital exists and in which there is every

reason to believe that such institutions could and would be maintained. There are other areas in need but they would experience greater difficulty in maintaining them. The city of Roosevelt in Duchesne and Uintah counties would be a logical location for a hospital because there are five improvised and badly equipped hospitals in this vicinity. From forty to fifty beds are needed. There is under construction a twenty bed hospital, but construction has reached a point of stoppage because of lack of funds at present. In view of this development, the committee would recommend that federal funds be made available to increase the capacity of this hospital to between forty and fifty beds as originally estimated for this area. The Green River section (Grand and San Juan counties and part of Emery) needs one general hospital, of twenty-five bed capacity, located at Moab. The Garfield and Panguitch County section (county seat) needs a hospital of twenty-five bed capacity. The area embracing San Pete County needs one twenty-five to thirty bed county hospital. The Millard County area needs a twenty-five bed general hospital. A children's hospital at Salt Lake City for the use of the entire state would be desirable primarily for taking care of crippled children who are brought to Salt Lake City under the crippled children's program. There are children's wards in the existing hospitals but no children's hospital. There is also a need for a children's isolation unit for the care of communicable diseases. There is no question about the maintenance of such a hospital. The state has gone about as far as our financial conditions will permit in the matter of construction for tuberculosis purposes, yet if federal aid was available for this purpose it is felt that the state could see its way clear to maintain additional facilities of this nature.

DR. CHARLES F. DALTON, Vermont: No new hospitals are needed but there is urgent need for strengthening existing institutions and if possible supplying funds for the maintenance of free beds. Specialized hospitals are of greater benefit. I suggest a loan service to indigents, the administrator of this fund to seek for those in need of its help and urge them to take advantage of it. The administrator of this loan fund should have authority to adjust terms of payments to circumstances.

DR. I. C. RIGGIN, Virginia: The estimated population of the state of Virginia is 2,470,972. There exist eighty general hospitals and nine tuberculosis hospitals, the latter having a bed capacity of 1,691. The ratio of general hospital beds is from 2 to 3 per thousand. From 60 to 70 per cent of the beds are occupied. No statement of needs is given. If the committee, after study of the situation in Virginia, should feel that additional hospital facilities under the plan which the President is considering are indicated, I shall be glad to do anything I can toward securing the data necessary for consideration by the committee.

DR. R. H. FLETCHER, Washington: The general hospital bed situation is fairly adequate except in Benton and Klickitat counties, which need fifty beds each. On the basis of two beds per annual death, 569 additional tuberculosis beds are required. A seventy bed tuberculosis hospital is needed in Vancouver or Longview; one ninety bed hospital is needed in Yakima. Some steps have already been taken in both of these areas to provide the necessary beds but lack of sufficient funds has so far prevented construction. At least 100 additional tuberculosis beds are needed to serve Whatcom, Skagit, Snohomish, San Juan and Island counties; fifty beds are needed in Wenatchee and some additional beds are needed in Grays Harbor and Spokane counties.

DR. ARTHUR E. MCCLUE, West Virginia: There is need of 325 general hospital beds in Grant, Greenbrier, Braxton and Webster counties, and 300 beds in a tuberculosis sanatorium. It was reported in 1938 that only 50 to 70 per cent of these beds (beds available in general hospitals) were occupied. There is evidently a special need for making the beds which are already available accessible to the population that is in need of hospitalization.

DR. C. A. HARPER, Wisconsin: Clark County physicians and people have practically no reasonable general hospital facilities. I have very strong assurance that there will be no difficulty in maintaining a hospital of at least fifty beds in Clark County. A good substantial building should be constructed that will give custodial care to at least 100 maximum benefit tuberculous cases. Such a hospital could be constructed adjacent to the Statesan near Waukesha or adjacent to and supervised by one of the county institutions. The state pays to the eighteen county and two private institutions \$7 a week for each patient in the institution, the counties meeting the remainder. In the state institution the state pays half and the counties half, except those patients who have no residence in any county, where the state meets all of the expense. A tuberculosis hospital should be constructed of such a type that will furnish good custodial care for the maximum benefit cases wherein the cost per week can be in the neighborhood of \$7 or \$8 compared with \$17 to \$21 in the county institutions.

DR. M. C. KEITH, Wyoming: There is one thirty-three bed sanatorium for tuberculous patients whose capacity does not meet the need of service and always has a waiting list. This institution is owned and maintained by the state. In places where there are no first class hospitals, I feel that, even if built and presented to them free of cost, the operation of such a hospital could not be maintained locally. Wyoming is fairly well supplied with hospitals. Even the more rural communities have small hospital accommodations.

SENATOR WAGNER: Did you find any opposition from any of the health officials of any of the states?

DR. PARRAN: None whatever; in fact, I have been surprised at the wish of some states who have the larger proportion, above the average, in hospital beds, to secure additional hospitals or a few additional hospitals to serve one or another area, or for tuberculosis. A few of the states, especially the Northern and Eastern states, have said that they do not believe they will need additional hospitals of this type, but it is the exception, as you will see in perusing the replies.

SENATOR WAGNER: In those cases where you find areas where the hospitals are not within reach, are there cases where they are 70 or 80 miles from the particular locality?

DR. PARRAN: There are a few, Senator, in the West and one of the sparsely populated areas, which of course constitutes a very serious problem. In the Dust Bowl Area, for example, much of the population has left. It is true that many people are a long way, 70 or 80 miles, as you say, from a hospital, but there are not enough people to support even a fifty bed or a 100 bed hospital. Just what can be done about that is a problem. Conceivably something less complete than a community hospital would be of some help, a place where there are two or three beds for emergency cases at least and where the county nurse makes her headquarters and perhaps has a little supply of serums and vaccines, which would be some help at least to such community. We would expect to be guided largely by the wishes of the individual community, working out different types of solutions for these different problems. Most people of the country do live within 30 miles of some kind of a hospital, but what kind of a hospital is it? It often is a fire trap or a proprietary hospital, to which a person cannot gain admittance unless he can pay or somebody else can pay for him. Frequently the beds are overcrowded. In other instances, however, there are proprietary hospitals which are partly empty simply because the doctors who own the hospitals can't afford to take care of the free patients in them and yet there are people who need the care.

SENATOR WAGNER: And without that care they will probably succumb to the disease?

DR. PARRAN: Frequently so.

Statement of Dr. R. G. Leland, Chicago

I have prepared for the use of the committee, if it so desires, some tables which give the costs for hospital construction, and other tables which give the cost of maintenance of hospitals. The building costs are influenced by climate, labor scale, freight rates, accessibility to building materials, methods of planning and utilizing of space, the extent and quality of built-in equipment, the ability of the architect and mechanical engineers, the number of private rooms and wards, and numerous other factors. The cost per bed varies, depending on the ratio of space occupied by patients to the total floor space of the hospital, the ratio of ward to private room space, and the facilities provided for nursing, administration, treatment, laboratory, operating room and outpatient services.

The costs of hospital construction are usually stated in terms of the cost per cubic foot. The cubic foot allowance in hospital construction varies from 5,000 to 8,000 cubic feet per bed. The costs shown in the tables which I shall leave for the committee have been figured according to various sizes of hospitals such as thirty bed, forty to fifty bed and larger—general hospitals. The information that I have collected indicates that a fifty bed hospital, with an allowance of 6,500 cubic feet per bed—the amount varies from 5,000 to 8,000 cubic feet per bed—will cost in the neighborhood of \$178,750 for construction, or a cost of about \$3,575 a bed. This figure is a cost estimate for the construction of hospitals by building contractors and not the method of using WPA labor such as is contemplated for the hospitals proposed by the legislation under consideration.

SENATOR TAFT: Could you give us that for a 100 bed hospital?

DR. LELAND: The figure I stated is for a fifty bed hospital. Do not have with me a similar cost figure for a 100 bed hospital.

[Dr. Leland next explained the technic of calculating costs of hospitals on a cubic foot basis, indicating in reply to questions that the calculation includes space used for all purposes of the hospital.]

SENATOR TAFT: Can you give us the figures, say for a 100 bed hospital? Would it be twice that amount? Dr. Parran's figures related to 100 bed hospitals, and I wanted to get comparison.

DR. LELAND: Yes. I am sorry that I do not have the exact figures for a 100 bed hospital.

SENATOR TAFT: That would be somewhat cheaper per bed, suppose, than a fifty bed hospital?

DR. LELAND: It probably would be slightly cheaper. I have here other figures which I shall give you in just a moment which may answer that question.

SENATOR TAFT: Now going back to your main figure, you said that a fifty bed hospital, construction only, would cost \$178,000. Have you got that broken down as to how that—

DR. LELAND (interposing): That is on the basis of 55 cents a cubic foot.

SENATOR TAFT: And how many cubic feet per bed?

DR. LELAND: 6,500. That includes all the items I mentioned. Fifty beds times 55 cents times 6,500.

SENATOR TAFT: Does that include equipment?

DR. LELAND: To that cost must be added the fees of the architect and consultants, which are usually about 6 per cent as I have figured it here, and the equipment, \$40,000, making the total for this fifty bed project \$229,475.

SENATOR TAFT: How do you account for the difference between your figures and Dr. Parran's, which would run less than \$100,000 for a fifty bed hospital? His figures are approximately one third of those that you give. How do you account for that difference?

DR. LELAND: The difference might be accounted for partly by the fact that the site for these proposed hospitals is to be donated, building materials may be somewhat different than for privately constructed hospitals and may be procured on the ground, labor costs may be somewhat less, and the construction, as I have understood it from some of the engineers, is to be of a type that will be as economical and thus reduce the overall cost as much as possible.

SENATOR MURRAY: Utilizing inexpensive materials and construction methods?

DR. LELAND: Yes, sir.

SENATOR MURRAY: A much simpler style of construction than the construction that you have reference to?

DR. LELAND: The construction of hospitals is a matter which can be simplified or elaborated according to the program or the desires of those who are responsible for the hospital. Some hospitals are inordinately elaborate and unnecessarily expensive. On the other hand, it is possible to economize to the extent of making the hospital less serviceable to the community. The most satisfactory method by which to arrive at the proper amount to devote to local hospital construction is to examine carefully the specific needs of the community.

SENATOR TAFT: Are your figures an estimate or is that a consensus of what hospitals have actually cost?

DR. LELAND: These figures I have given represent the average of what hospitals have cost.

SENATOR TAFT: That is what I wanted to know.

SENATOR ELLENDER: Dr. Leland, I think Dr. Parran did state that the cost for a 100 bed hospital would be about \$1,800 per bed but that, if a smaller hospital were built, the cost per unit would probably increase to \$2,500, so that if you multiply that by 2 it wouldn't be exactly right?

DR. LELAND: No. The expenditures for hospitals which were constructed from July 1933 to December 1936 inclusive by the PWA are as follows: For state hospitals the average cost per bed was \$2,010; state universities, \$2,790; county, \$2,140; city, \$3,430; joint county and city, \$3,810; nonprofit corporations, \$2,650, and an average of the total, \$2,330.

SENATOR TAFT: \$2,330?

DR. LELAND: Yes, sir.

SENATOR TAFT: And they are more expensive in the cities; the rural hospitals would be somewhat cheaper?

DR. LELAND: They might be, although there is a certain cost connected with providing water, sewerage and lighting in the rural communities that might be more economically supplied in the city.

SENATOR TAFT: These figures, however, that you have given, relate only to construction and not to equipment?

DR. LELAND: That is right.

SENATOR TAFT: Dr. Parran's figures, I take it, without equipment, are about \$1,300 a bed?

DR. LELAND: Yes, sir.

SENATOR TAFT: As compared to your figures of \$2,000?

DR. LELAND: Dr. Parran's figures, as I understand it, did not include labor.

SENATOR TAFT: Yes, they included labor but they didn't include the site.

DR. LELAND: I did not understand that. I have another summary of nonfederal hospital projects which shows an average of approximately \$3,000 per bed, showing the type of institution, such as insane asylum, schools for feeble-minded, the epileptic, tuberculosis, general, charitable homes and all others.

[Dr. Leland also offered to the Committee analyses of costs of hospitals according to the total number of beds, nature of construction, and similar factors.]

DR. LELAND: The estimated total expense per bed for maintaining hospitals: I have here one table taken from the Business Census of Hospitals, showing an estimated annual expense of \$678. In the different sections of the United States: Northeastern, it is given as \$1,243; in the Southern, \$876; Central, \$1,041, and Western, \$1,118. The difference in the cost of maintenance, according to the size of hospitals, is of some interest. The annual maintenance cost for hospitals of less than twenty-five beds is reported to be \$808; from twenty-five to forty-nine, \$884; from fifty to 149, \$1,037, and 150 and over, \$1,182. Figures are also shown according to the size of the county or city, whether it is a state, county or city hospital, or whether it is a nonprofit or a proprietary hospital. According to the size of hospitals, the total cost, including depreciation, per day is \$6.58 per patient for less than 100 beds. The average cost per patient day for general hospitals in 1929 was \$5.56, and in 1933 it was \$4.51, with the special hospitals showing an average cost per patient day in 1929 of \$3.44, and in 1933 of \$2.74. Maintenance cost figures are also given according to the type of general hospitals, such as independent, Roman Catholic, other church hospitals, proprietary and government, and the special hospital is likewise given.

SENATOR TAFT: How do you obtain those costs? Do you get regular reports or send out a questionnaire?

DR. LELAND: Some of these figures were prepared by the Health Division of the Council of Social Agencies of Chicago. One of the tables was taken from the Hospital Survey for New York, and others were contained in *Public Health Reports*. They have been taken from various sources that are constantly making studies of this kind to determine at what cost and at what efficiency hospitals operate in order better to suggest how to improve hospital services. The figures vary throughout the country according to the type of hospital, the size of hospital and type and efficiency of its administration. They are offered merely as a record of what has been done, in order that some idea might be gained of what might be in store for those who operate the hospitals contemplated under this legislation.

SENATOR ELLENDER: Do the tables itemize the various items to make up the cost of \$4.51, for instance?

DR. LELAND: Yes, sir.

SENATOR MURRAY: Doctor, the reason why these larger hospitals are so expensive is the fact that they are constructed according to architectural design, and each architect has his own notion about how a hospital should be built.

DR. LELAND: Exactly.

SENATOR ELLENDER: Then, if under this program they should design some standard style of building and use inexpensive materials, these hospitals could be constructed very cheaply in comparison to the hospitals of the country?

DR. LELAND: I would expect that a considerable number of the more expensive hospital construction items would be reduced or eliminated by a more uniform plan of construction.

Statement of Dr. Olin West, Secretary and General Manager of the American Medical Association

[Dr. West presented a statement of the general policies of the Association with respect to medical service and public health and also a copy of the statement submitted to President Franklin D. Roosevelt by representatives of the American Medical Association and the three national hospital organizations of the United States. He explained the nature of the organization of the American Medical Association and the manner in which it represents the medical profession.

Concerning the suggestion that the size of a hospital be commensurate with the needs of the community and the ability of the community to support a hospital, Dr. West said:]

DR. WEST: Now, Mr. Chairman, I think that it is highly essential that the determination of the size of the hospital that is to be built for any community shall be made with due regard to the possibility of that community utilizing a hospital of a given size and its inability to utilize a hospital of any larger size. It would, in my opinion, be folly to provide a 100 bed hospital for a community that had no possible need nor any possibility of properly administering and operating a hospital of more than thirty beds.

SENATOR MURRAY: You are familiar with the provisions of the bill which provide an advisory council which consists of the Surgeon General, as chairman, and six members appointed by the Surgeon General. "The six appointed members shall be selected from leading medical or scientific authorities who are outstanding in matters pertaining to hospitals and other public health services." Do you think that would safeguard the situation?

DR. WEST: I consider that the most important section of the bill. If these hospitals are to be built, I think it is essential that the Surgeon General shall have the advice and the aid of men who really understand the hospital problems and know all that is involved in the operation of the hospital.

SENATOR TAFT: Your principles go further than that, don't they? They require advice in any particular state from the state officials and the various medical associations connected with the state and locality?

DR. WEST: Well, that was particularly to be in connection with showing the need for hospital facilities and probably for locating hospitals. I think this bill, Mr. Chairman, places a tremendous burden on the Surgeon General and I know, because of my own personal knowledge of many operations that are conducted under his direction, that he would welcome and would lean heavily on the advice of a properly selected, competent advisory council.

(Continuing):

"3. Means for the maintenance and upkeep of such hospitals rank in importance equal to that of construction."

Now, Mr. Chairman, I confess that personally I have some doubt that a good efficient hospital can be built and equipped for \$1,500 a bed. I don't believe that any hospitals that are to be built under the provisions of this bill should be ornate institutions. As a matter of fact, if these hospitals are to be built I hope they will serve as models for all communities that desire to establish hospitals, with all of the ornate frills and unnecessary furbelows left entirely out.

It is true, as one of the Senators stated a while ago, that much of the expense of construction and maintenance in some instances is due to fineries that are not essential for the operation of a good hospital. At the same time it would be folly, in my opinion, to build a hospital, whether you build it cheaply or whether you build it ornately, unless it is so arranged as to make it possible for the personnel to serve efficiently, economically and with proper care and regard for the conservation of their own strength and for the value of their services.

I have seen some of the plans that have been proposed for these hospitals, and I am quite sure that the Surgeon General and his advisory council, when it is formed, as well as the engineers in charge of construction, will see fit to make some changes in these preliminary plans.

(Continuing):

"4. Since the important objective of the program is the service it can render, hospital construction and administration, equipment, staff and personnel should meet the standards which the American Medical Association, the American College of Surgeons and the Hospital Associations regard as minimal for rendering such service in the various localities."

Now, Mr. Chairman and Gentlemen of the Committee, the organizations mentioned in this part of the statement have given a great deal of time and effort, sincere and devoted effort, to the establishment and maintenance of high standards of medical and hospital service, and they are sincerely interested that nothing shall be done that will demote or will tear

down the high standards that it has been possible so far to erect and to maintain with reasonable success.

[Dr. West also emphasized the importance of maintenance of standards and affiliation of small hospitals with larger institutions in the vicinity. He pointed out the personal factor which causes patients to pass good hospitals frequently to consult a special hospital which they desire. He called the attention of Senator George specifically to the situation in Columbus, Ga., saying:]

Now Senator George has, no doubt, in mind certain areas in his own state, and they exist in most other states for that matter, where there are hospital facilities available and some of the counties nearby that do not use these facilities, though in my opinion it would be reasonably easy to make arrangements of such nature that the facilities of existing good hospitals could be used by the people of these counties in which there are no hospital facilities. Take, for instance, at Columbus, Ga., where there is a 175 bed hospital, and it is a good hospital. Now the people in the adjoining counties do not use that hospital because it was built and is intended to serve the people of the county in which Columbus is located. But I daresay that, if the county commissioners or the county courts, or whatever the governing bodies in the counties may be, would make an arrangement with that hospital in Columbus, whereby they would pay a per diem for the care of the patients coming in to Columbus from those counties, they could be fairly well taken care of, and that the situation could be met with reasonable success.

Ambulance service and good roads will permit this type of service to operate safely, efficiently and economically in communities not financially able to support a hospital.

That is the statement that was left, filed with the President, and is submitted for such consideration as your committee may care to give it.

[Dr. West filed with the committee copies of the material published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION relative to this hospital bill. He then concluded:]

Now I should like to say furthermore that the American Medical Association is interested in the extension of public health service and in the extension of good medical service. There is no group, nor any organization anywhere, that has been more interested or that has more clearly shown its interest, that has exerted itself, its utmost effort for nearly a hundred years to establish and to maintain higher and better standards of medical service, and to extend medical service to all those in need. And when Congress has decided what it intends to do with respect to these matters, I should like the committee to know that the American Medical Association stands ready to make available to this committee, or to Congress, at any time, any information or any assistance of any kind that it can offer to promote any sane, reasonable and sound program for the promotion of public health and medical service.

SENATOR WAGNER: I didn't have a chance to read the pamphlet to which you referred. Does that generally speak favorably of this pending bill we are now considering?

DR. WEST: Mr. Senator, I think that I could say yes. We do feel that the bill does need some clarification. We think there are some amendments needed.

SENATOR WAGNER: I am talking about the objectives of the legislation.

DR. WEST: Nobody has ever questioned the objectives.

SENATOR TAFT: Did you find anything in the bill to indicate any possibility of cooperating with existing private hospitals or in any way assisting them?

DR. WEST: No, Senator, I don't think that that point is definitely covered. I think there are several things in the bill that need clarification, but Dr. Fishbein and Dr. Cutter are here to discuss these matters, if it please the Committee, and I should be glad to let them come before the Committee and will not impose on you further.

Statement of Morris Fishbein, Editor of The Journal of the American Medical Association, Chicago

DR. FISHBEIN: We believe that most serious consideration should be given to this bill not only because it is an experiment but primarily because experiment may set a pattern for future health legislation. Obviously this does not represent the

complete needs of all of the people for medical care, as is, I believe, contemplated in the development eventually of something called a national health program. We believe that this bill was rather loosely drawn, with the idea that it would be considerably modified before having final action. I think it was Senator Wagner who said before that "bills are not written but rewritten." Therefore we have rather carefully analyzed certain phases of this bill with a view to seeing how far they meet the criteria which we believe are necessary in order to set up a reasonably safe pattern for the extension of hospital service through the national government.

The opening of the bill, section 2 particularly, assigns the sum of \$10,000,000, and for each fiscal year thereafter such sums as the Congress may deem necessary for carrying out the purposes of the act. That obviously places no limitation whatever on the act. Once the pattern is set, it may be carried on by succeeding Congresses unless the bill should happen to be withdrawn at some future date by action of the Congress. It would seem to us that perhaps some limitation might be set on the eventual completion of this particular project.

Section 4 has to do with the hospital council. We believe that is the most important portion of the bill. The building and maintenance of hospitals is a specialized job in every sense of the word. It has come to be one of the most serious and important activities that we have in the country.

Now here is a committee of six, set up to advise with the Surgeon General, but obviously a committee without specific authority of any kind except to advise. It is true that, under the present Surgeon General, we could I am sure depend on his following the advice of a suitable committee for the good of the people. Again here we are dealing with the fact that the bill has no terminus of any kind. It might be best if, in some manner, it should be indicated that the committee has something in the nature of an authority. How that might be worded is a matter for those who draft bills. It would seem to me that it is a question of the approval of the committee. The Surgeon General, as chairman, with the approval of the committee, might do certain things, rather than with the advice of the committee. The committee would then be able both to advise and approve. There is a statement that "No appointed member shall be eligible to serve continuously for more than three years, but shall be eligible for reappointment if he has not served as a member of the Council at any time within twelve months immediately preceding his reappointment." About that I would merely ask Why? If you have the most competent men that you can get to serve on an advisory body, why should you drop them after three years or permit them to remain away for a year and then come back again? It would seem to me that here is a function in which the longer the men had been experienced, perhaps associated with their good health, they might be more and more valuable. So I see no reason why these men should be limited to a term of three years, which is a short time when you are building and operating hospitals.

SENATOR MURRAY: You believe in a third term principle. I assume?

[Laughter.]

DR. FISHBEIN: I refuse to answer that on advice of counsel.

There is nothing specified as to how often the committee shall meet. The committee ought to have something specific as to the frequency with which it should meet with the Surgeon General. I should take it for granted that at least once a year there ought to be a specified meeting at which they would resurvey the entire year's work and make an official report. Otherwise, they might meet on very rare occasions, indeed, since all of the authority under the present measure rests in the Surgeon General. Now if you were to begin with section 5 and make it read: "The Council is authorized to advise the Surgeon General with reference to the carrying out of the provisions of this act, including" to review applications, to formulate standards, to formulate rules and regulations, to review reports and inspections, then you have given your council something in the nature of authority. They are authorized to do things with the Surgeon General as chairman.

This Committee is authorized to advise the Surgeon General and the Surgeon General is authorized, in section 6, to approve hospital projects, to designate their location, and so on. The

law should be a little more specific so as to limit these actions definitely to these projects and not to hospital projects in general. You might say "to approve hospital projects provided for under this act" and "to provide training and instruction of personnel who will be required to carry out the purposes of this act." In other words, limit the function definitely to the hospitals built under this act. Perhaps it would be so limited, but in the interests of accuracy the wording might be changed so as to make it specific rather than general.

In subsection (f) you might say "including the safeguarding of the quality of service furnished in these hospitals." This would not put the Surgeon General in the position of conducting an annual survey of all hospitals, the quality of their service, their personnel, and thus creating a national hospital agency.

The question of greatest importance, and one to which Senator Taft has already referred, is the question of the extent to which the federal government undertakes to set up a chain of federal general hospitals. That is not adequately safeguarded, in our mind, under section 6 (h). It is obvious there that a mere leasing of these hospitals to the community, hospital district, state or whatever organization might be set up to conduct such a hospital, for a period of three years, under a contract which will merely cause them to maintain it consistent with the standards established, does not safeguard the nation or the state against eventually setting up a complete system of federal care of the sick.

We have thought that it might be desirable to indicate in some way what happens to these hospitals after the Surgeon General decides to terminate a lease. Should he decide to do so at the end of three years, there is nothing in the measure that says what happens to the hospital after the Surgeon General terminates the lease.

It has seemed to us possible that it might be suggested that a new lease be negotiated with some other responsible agency, if the first agency has not carried out the contract satisfactorily. Perhaps it should be sold to the state so that the state itself would take it over. But there should be specific provision as to what is done with these hospitals. The same question will come up in a much larger way some time in the future, unless there is another war, as to what is eventually to be done with the veterans' hospitals, of which there are a considerable number over the nation. It is conceivable that some day there will be a lack of occupancy.

I am not enough of a lawyer to know how one would settle this. It would seem to me possible to put in a restrictive clause to say that these hospitals shall not be conducted by the federal government. In other words, make this point doubly restrictive, not only by saying that the hospitals shall be conducted by the local agency or by the state, but to make it doubly restrictive by saying that should the lease be terminated they shall not be conducted by the federal government.

The next suggestion has to do finally with that function to which attention has already been paid, I believe by Dr. Thomas Parran in his discussion. The meaning was not clear to us of that statement which says that the Federal Works Agency is further authorized to expend out of appropriations available to itself, in accordance with the purposes thereof, such sums as may be necessary for the completion of the project but without regard to specific limitations imposed on the use thereof.

That is so broad and so loose and so completely undefined as to exactly what might be done, that it practically places no limitation on any work of this kind that might be conducted. Even the setting up of an additional \$10,000,000 would not mean a thing provided the Federal Works Agency could go ahead as far as it wanted and complete any project which might be started under this act. There is no limitation whatever placed there. It could start innumerable projects and then, with the Federal Works Agency, complete them.

SENATOR TAFT: It could only provide labor, I think, however, and not materials?

DR. FISHBIN: That is the reason it is not clear! One has to take into account work that the Federal Works Agency is entitled to do. I do not know what they can do, but I know that with the aid of the Federal Works Agency hospital

construction in this country for the past five years has been steadily accelerated. The rate of hospital growth for a period of five years has been quite up to the rate of hospital growth in the previous twenty-five years and is steadily rising. The normal growth of hospital beds has been maintained steadily in this country. With the aid of the Federal Works Agency and other groups who now have money to expend there has been a fairly steady growth of hospital beds.

It seems to me, of course, that leaving the authority primarily with a council that is dependable is the real answer to the question. I do not see that it is possible for anybody at this time to endeavor to say just where these hospitals should be put down or how they are to be constructed. But if we have confidence in the Surgeon General and in the committee which he will appoint which will have some authority, we then authorize a certain appropriation and we define the principles under which that appropriation is to be expended.

I believe, for instance, from my own analysis of hospital beds and the lack of them in this country, that the one most important problem today is the provision for adequate beds for Negroes in certain states of the South. If one were to study the needs on the basis of the greatest need that exists, that would seem to be the greatest need that exists at the present time. That can be very easily seen by the tables which Dr. Cutter will leave with you, which show the available beds in various portions of the country for white and for colored and for various other purposes.

Now, the definition of a hospital, at the bottom of page 7, states: "The term 'hospital' as used in this act shall include the physical facilities necessary for the prevention, diagnosis, or treatment of disease, and for the protection of the public health." That raises a serious question in relationship to medical service, mainly the combination of the public health agency with the hospital. There are considerable differences of opinion as to whether or not the hospital in a small community shall be made, at the same time, the office of the health official who is appointed. The question of political control in the use of the hospital beds enters at once, if the public health official for the community has his office in the hospital. Since the primary problem before us today is care of the sick, it is a question whether or not it would be better here to prevent any attempt to utilize these hospitals as public health officials' offices. We might merely say that "The term 'hospital' as used in this act shall include the physical facilities necessary for the care of the sick." Finally, it is quite important that there be made available, after each of these projects is completed, if they are completed, a definite statement as to the manner by which the need was determined and the final disposition of the fund, and perhaps at a later date, if this is to be conducted as a scientific experiment, at some later date, two, three or four years hereafter, an actual report on the manner in which these institutions function.

Statement of Dr. William D. Cutter Secretary of the Council on Medical Education and Hospitals of the American Medical Association

The most complete and the most accurate figures with regard to the distribution of hospitals and hospital service are those which we have been publishing annually for a period of fifteen or twenty years. When we came before you earlier, we left with you copies of the report on hospital service for the year 1938. A new report, covering the conditions for the year 1939, will be published the last of this month. I shall be glad to see that a copy of that report is placed in the hands of each member of this committee. We have recently completed a survey of the facilities for the care of tuberculosis. Dr. Parran mentioned the importance of that problem and I should like to leave a copy of that report with you.

We have seen statements printed and published in the United States to the effect that there are in the United States something like 18 million people living in counties which have no general hospital. This may be true, but it is quite irrelevant. Hospitals can and do serve residents of other counties than the one in which they may be situated. In Illinois we have twenty-nine counties in which there are no general hospitals, but every person living in every one of those counties has access to some

hospital in an adjoining county. It is not necessary to suppose that hospitals must be built in every county. Instead of there being 18 million people who, for geographic reasons, do not have hospital facilities available, there is probably less than 2 per cent of the total population of the country which could not easily reach a hospital in case of need.

SENATOR MURRAY: All those considerations could be had in mind by the advisory committee, I assume, in determining the need for the hospital?

DR. CUTTER: Undoubtedly they would, and because it is important to investigate each one of these conditions individually we undertook about a year ago to make a study of one state. We chose Mississippi, because frequently that state has been cited as one of the states which lack adequate medical care. This was not a swivel chair survey, based on reports and documents. We had three men who worked in the state of Mississippi for periods averaging about three weeks. They visited every county, every hospital, every local health officer as far as possible; they got in touch with charitable organizations, district nursing societies and every one who might be supposed to know something about the conditions in the state of Mississippi. As a result of all these interviews they concluded that in the entire state of Mississippi there were no white persons who could not secure hospital facilities if they desired. The number of beds available for Negroes, as was just pointed out by Dr. Fishbein, was not adequate. The figures are given here, I think, in one of these tables, that I should like to leave with you. The total number of beds in the state of Mississippi, both white and Negro, is 1.5 per thousand of population. For the white population it is 2.4 and for the Negro population 0.7.

It is apparent that 2.4 beds per thousand for the white population in the state of Mississippi takes care of their demands, but it is obvious that 0.7 bed per thousand Negroes is not sufficient. However, this figure of so many beds per thousand, which is sometimes used as a criterion of the need, is not really a valid or useful measure of the need because conditions are different in the large industrial cities from what they are in the rural portions of the community. People who live in a city like New York, in apartment houses, have no way of taking care of themselves when they are sick. People who live in the country and on farms have plenty of room and they can usually get somebody to wait on them. They don't have to go to a hospital with every trifling ailment in a way that people in the large cities often do.

We would be glad to supply the members of this committee with additional copies of these documents, which I am filing here, and to give you any aid and assistance that we can possibly give you with respect to the distribution and service of hospitals in this country. We would emphasize that in determining the need one must go into a locality and determine what the conditions actually are rather than assume that need on the basis of certain statistics with reference to the number of hospitals in the county or the number of beds per thousand in the state, or something like that.

SENATOR TAFT: Doctor, have you surveyed the other question, which seems to be more important than the construction and physical existence of hospitals, and that is the providing of money for people to be taken care of in hospitals? I mean, for instance, we may say that you may have a hospital in one county perfectly adequate to care for, say, seven counties around it, and yet there may be no law or provision by which those poor people in those communities can go to that hospital in the other county. Is there any survey of that kind of thing?

DR. CUTTER: I know of no such survey; we have made none, but that condition does exist; really that is the principal reason why people in any part of this country may be unable to secure adequate hospital service. It is a financial barrier and a lack of assumption of responsibility in the communities where they live.

SENATOR TAFT: Isn't it a much more serious problem than the lack of hospital facilities?

DR. CUTTER: I think it is! Dr. West cited a moment ago a hospital down in Columbus, Ga., which could well take care, as far as physical facilities are concerned, of the population in several surrounding counties, but if those counties won't assume the responsibility of paying a per diem for their sick people,

then that one county can't be expected to carry the full load. If those counties will not assume the responsibility of paying a per diem for their patients to go to the Columbus hospital, can it be supposed that they would assume the responsibility for a hospital in their own community?

SENATOR TAFT: Have you any comment to make about the difference in theory between this bill and the original bill? As I understand it, the other bill provided for federal aid in the construction of hospitals only partially and required the localities to put up some money and then provided for federal assistance also for the ordinary maintenance of the hospitals whereas this bill gives 100 per cent for the construction and provides nothing whatever for maintenance of any kind, or taking care of these people who have no other way of getting help.

DR. CUTTER: I don't believe I can offer any explanation of that, Senator. I do know that when the other bill was being considered there was some criticism offered of the provisions of that bill because on this matching basis it was supposed that certain states, in order to get some appropriation from the federal government, might be tempted to make appropriations of their own which perhaps they were not justified in doing. They would assume a bigger burden of debt just for the sake of getting some additional money from the federal government. I think it was pointed out in connection with this present bill that it was designed to avoid that particular objection. Under this bill hospitals would be built by the federal government where need was shown, and without putting any additional burden on the local community other than that of maintaining the hospital after it was erected.

SENATOR TAFT: As I understand these figures, the cost to run it for one year is 40 per cent of the whole cost of construction.

DR. CUTTER: That is probably true, sir.

SENATOR WAGNER: Well, Doctor, while I don't surrender for a moment any of the views expressed on the original bill, this legislation meets to a great extent the objection which the American Medical Association made to the other bill; as I recall, all of the spokesmen stressed the point that this legislation should provide for hospitalization only where there was need shown, and under no other circumstances. To that extent that objection is met by this legislation?

DR. CUTTER: I think it is wisely provided in this bill that the hospitals shall be built only where the need is shown. I wish it could be made also clear, as it was in the President's statement, that they should be built only where the ability to maintain the hospital can also be shown. The former bill provided that the federal government should assist in the maintenance. This does not.

SENATOR GEORGE: Isn't it included in this bill that the Advisory Council shall determine the ability of the community to maintain the hospital?

SENATOR WAGNER: That is one of the conditions.

SENATOR TAFT: A county that couldn't provide 1 cent to build a hospital certainly couldn't provide any maintenance at all, isn't that true? If that county is unable to make any contribution to construct the hospital, it is not going to be able to maintain the hospital; isn't that very obvious?

DR. CUTTER: Well, it might prove that way. I wouldn't like to say that there would be no exceptions to that rule, but it might turn out that a great many of these counties which were unable to make any contribution toward the construction of a hospital would find it difficult to maintain a hospital.

SENATOR MURRAY: Then no hospital would be built under those circumstances because they wouldn't qualify?

DR. CUTTER: We believe that if this bill is administered strictly in accord with that provision, to which Senator Wagner referred, it would be impossible to build hospitals in some of those communities, even though they might feel that they wanted them.

SENATOR GEORGE: Dr. Cutter, of course undoubtedly it is true that even if you take my state of Georgia, perhaps there are hospital beds available, although sometimes you have

go a long distance, to most of the people who need hospitalization. But undoubtedly the great problem after all is to get the people who need hospitalization to go to the hospital, and isn't it an important factor that must always be considered, the proximity of the hospital to the people who do need hospitalization? It isn't the mere question of going across the state. My county is 80 miles, for instance, from Columbus. We have no hospital. We could go to Columbus. There are nearer hospitals than Columbus for the people of my county. But it often does occur, does it not, that people will not go those long distances for hospitalization, for hospital treatment, except where it is absolutely and imperatively necessary? The condition of the family must be kept in mind and even prejudices of the people who need medical attention must be kept in mind. If there is an available hospital, more or less under local supervision so far as its operations are concerned, many more people might go to that hospital than otherwise would go to the hospital in more remote situations, in cities, maybe. There are people in my section of the state, take our colored population, who would be utterly lost if they were carried off to a city for an operation and hospitalization; their family wouldn't feel free and wouldn't have the economic power release to visit the sick in the hospital. Consequently it is hardly a fair statement to say that, although you might find the hospital if you are able financially to go and find it, you really have any adequate hospital facilities, because somewhere within the range of the patient is an available hospital.

DR. CUTTER: Senator, I think all of the conditions you have mentioned must be taken into consideration. The accessibility and the availability of a hospital vary of course with geographic location. There may be mountains, there may be unbridged rivers, there may be swamps, there may be no road. On the other hand, in a perfectly level country like Illinois, with good roads, it is easy to transport people 20 or 25 miles. But the real question is not the question of the distance which a patient might have to go, the question is whether, closer to his home, an adequate hospital could be maintained. We have heard a good deal said this morning about the financial responsibility for maintaining these hospitals, and that question is important. But there is another question which is of even greater importance! That is the question of whether you can provide an adequate personnel to operate the hospital.

SENATOR GEORGE: That is true.

DR. CUTTER: Just putting up a hospital where there aren't adequately trained doctors is likely to do more harm than good. Unless you have adequately trained doctors in that hospital you won't be serving the best interests of your patients by bringing a hospital close to their door, and you can't expect adequately trained doctors to stay in a hospital unless they have a sufficient volume of work to keep them busy. A surgeon, for example, who operates only once a week isn't going to be very long a good surgeon. Unless the population surrounding the hospital, and tributary to it, and availing themselves of it, is of sufficient magnitude so that there is a sufficient volume of illness coming into the hospital to keep a well trained staff of physicians occupied, you are not going to get the best kind of service in that institution. That has to be kept in mind in considering this question of the need and ability of the community to support a hospital.

SENATOR TAFT: If you started off to create an ideal hospital system in a state, you wouldn't put a hospital in every county seat in a state like Illinois, would you?

DR. CUTTER: You couldn't possibly do it.

SENATOR TAFT: It would be much more satisfactory to consolidate them in certain units to cover the entire state?

DR. CUTTER: Absolutely! Within certain limits the larger the staff of the hospital, and the larger the hospital, the more efficient service you can render. You can have more specialists of different kinds, more special equipment and more specially trained nurses, and you can render in general a better character of service in a hospital which has 100 or 200 patients a day than in a hospital which has only twenty-five or thirty. The best interests of the people would be observed by putting good hospitals which can be well staffed and well maintained in just as many places as there are communities able to sup-

port them. Then encourage the other people who live in communities where they can't support such hospitals either to have emergency stations close at hand or to go, if practicable, to the hospitals which are well equipped and well staffed.

SENATOR WAGNER: Doctor, your survey that your Association made does show the absolute need of hospitals in certain areas of the country, isn't that so?

DR. CUTTER: This survey covered only the state of Mississippi. With respect to the white population it showed that hospital facilities were adequate but it also showed a lack of beds available to the Negro population.

SENATOR WAGNER: You would take into consideration of course the factors that you indicated a moment ago. You would take them into consideration if you were a member of the council?

DR. CUTTER: Yes. I should like to call the attention of the committee to this map. Dr. West mentioned that persons often traveled a longer distance than seemed to be necessary to get to a hospital. This map was taken by getting each hospital to give us a record of the homes from which patients came, provided they lived outside the metropolitan community where they would naturally go to the hospital. And you will see, by following these lines, that many people traveled right by one or two or sometimes three hospitals to get to the hospital they chose to go to, presumably because they could find a type of service in that institution which they couldn't find in the institutions nearer by. But it does show that in a level state like Mississippi, with good roads, people don't object to traveling considerably where they have a reason for it.

AFTERNOON SESSION

Howard A. Dawson, Director of Rural Service, National Education Association

MR. DAWSON: I am Howard A. Dawson, the director of rural service for the National Education Association of the United States. We consider that the health of the school children is a matter of primary importance and that school is closely related to all matters of health and especially the public health.

The National Education Association has a plank in its platform which I should like to read into the record:

Every child, regardless of race, belief, economic status, residence or physical handicap should have the opportunity for fullest development in mental, moral and physical health and the attitudes, knowledge and skills that are essential for individual happiness and effective citizenship in a democracy.

The American Association of School Administrators, in its convention at St. Louis about two weeks ago, had the following statement to make:

The American Association of School Administrators believes that the greatest wealth of our nation, both immediate and potential, is its people; that human values are basic and that government exists primarily to insure the greatest possible protection and cultivation of its human wealth.

In the face of the tremendous gains that have been made in the development of the material resources of our nation and the increasing emphasis on the conservation of our national wealth, this association urges the American people to recognize that their primary responsibility is toward humanity and to work for the conservation and cultivation of these human resources at least with the same degree of intelligence, zeal and devotion as is at present being demonstrated in the development and preservation of the material resources of our nation.

We know that there are many children in the United States living in communities that do not and never did have adequate health service, and we are thoroughly convinced they are not going to, except through local, state and federal financial assistance. That does not necessarily mean that we are advocating what is sometimes known as "state medicine." It does seem to us that the least the federal government could do would be at this time to spend a mere pittance of ten million dollars to get hospitals in these areas where children are neglected. I should also like to point out that these very areas where there are the least medical and educational services are the areas from which the surplus population of the United States is coming. This particular bill has not been before our association and has not been approved, but I will say that it is in conformity with our platform and program.

(To be continued)

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—A subcommittee of the Senate Committee on Education and Labor held a public hearing, March 18 and 19, on S. 3230, Senator Wagner's bill to promote the national health and welfare through appropriation of funds for the construction of hospitals. Senator McNary, Oregon, has served notice that he intends to offer amendments to S. 3230 to permit the funds to be made available by the bill to be used "for the enlargement of publicly maintained hospitals" as well as for the construction of new hospitals. S. 1460 has been reported to the Senate, with amendments, providing for uniform reciprocal hospitalization in any Army or Navy hospital for retired personnel of the Army, Navy, Marine Corps and Coast Guard. S. 3633 has been reported to the Senate, providing that a candidate for appointment in the Dental Corps of the Army, to be eligible, must be a graduate of a recognized dental college, have been engaged in the practice of his profession for at least two years subsequent to graduation, or must have, after such graduation, satisfactorily completed a dental internship of not less than one year in a hospital or dispensary. H. R. 1008 has been reported to the House, with amendment, conferring on certain persons who served in a civilian capacity under the jurisdiction of the Quartermaster General during the War with Spain, the Philippine Insurrection or the China Relief Expedition the benefits of hospitalization and the privileges of soldiers' homes.

Bills Introduced.—S. 3654, introduced by Senator Sheppard, Texas, and H. R. 9091, introduced by Representative May, Kentucky, propose to amend the National Defense Act so as to provide that hereafter the authorized maximum number of enlisted men of the Medical Department of the Regular Army shall be in each fiscal year such number as shall equal 7 per cent of the average annual pay strength of the active list of the Regular Army and the average strength of all other military personnel on extended active duty with the Regular Army during such fiscal year. S. 3660, introduced by Senator Capper, Kansas, proposes a federal appropriation of \$50,000,000 for the fiscal year ending June 30, 1941, and thereafter such sums as may be necessary, to induce the states to embark on a program of compulsory and voluntary health insurance. H. R. 9017, introduced by Representative Edelstein, New York, provides that the officers and enlisted personnel of the United States Reserves requiring hospitalization and medical care shall be entitled to enter any army or navy hospital on their own personal request, under the same conditions as are now or which may hereafter be fixed for the active service. H. R. 9040,

introduced by Representative Rankin, Mississippi, proposes to provide domiciliary care and medical and hospital treatment to persons recognized as veterans of the World War under public laws in effect on March 19, 1933. H. R. 9052, introduced by Representative May, Kentucky, proposes to amend the National Defense Act so as to eliminate from it the requirement that a candidate for appointment in the Dental Corps of the Army must have practiced two years after graduation. H. R. 9134, introduced by Representative Fulmer, South Carolina, proposes to promote the national health and welfare through appropriation of funds for the construction of hospitals. This bill is a companion bill to Senator Wagner's hospital construction bill, S. 3230. H. R. 9097 and H. R. 9098, introduced by Representative Mills, Louisiana, propose to provide hospital allowances to dependents of indigent hospitalized veterans.

STATE MEDICAL LEGISLATION

Mississippi

Bills Introduced.—S. 322 proposes to authorize the boards of supervisors of the several counties to levy a special one mill tax for the care, treatment and hospitalization of indigent persons suffering from tuberculosis. H. 725 proposes to appropriate \$1,205,892.60 for the fiscal years 1940 and 1941 to be used to provide treatment and hospitalization for the indigent sick. H. 723 proposes to turn over the present state charity hospitals to the counties in which they are located for operation as county charity hospitals, reserving to the state the right to resume control of possession at any time that it deems necessary on the payment by the state of the reasonable value of all equipment and supplies installed by the counties in the hospitals during their operation of them. H. 726 proposes to authorize the board of health to procure and distribute free of charge the proper serum or vaccine for vaccination for hydrophobia.

New York

Bill Introduced.—S. 1992 proposes to authorize superintendents of schools, under regulations to be issued by the appropriate board of education, to require any employee, or applicant for employment, of the board of education to submit to a medical examination.

Rhode Island

Bill Introduced.—H. 1033 proposes to enact a uniform food, drug and cosmetic act regulating the manufacture, sale, distribution and advertising of drugs, cosmetics, foods and therapeutic devices.

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

- April 9—Sexton School Parent Teacher Association, Chicago.
- April 17—New England Health Institute, Hartford, Conn.
- April 22—Riverside Junior Women's Club, Riverside, Ill.
- April 25—American Association of Health, Physical Education and Recreation, Chicago.
- April 30—Iowa Public Health Association, Des Moines, Iowa.

DR. MORRIS FISHBEIN:

- April 8—City Club, Sherman Hotel, Chicago.
- April 11—Rotary and Service Clubs, Kankakee, Ill.
- April 14—Phi Delta Epsilon, Chicago.
- April 17—Jackson County Health Forum, Kansas City, Mo.
- April 19—Kentucky Education Association, Louisville, Ky.
- April 25—Medical Association of Georgia, Savannah, Ga.

DR. R. G. LELAND:

- April 2—Stephens College, Institute for Consumer Education, Columbia, Mo.
- April 18—St. Clair County Medical Society Auxiliary Laity Day Tea, East St. Louis, Ill.

MR. A. M. SIMONS:

- April 2—North Shore Branch of Chicago Medical Society, Chicago.

DR. PAUL A. TESCHNER:

- April 10—Vocational and Educational Conference, De Kalb, Ill.
- April 15—Women's Club, Chilton, Wis.
- April 22—Nebraska Tuberculosis Association, Omaha.
- April 26—High School, Aurora, Ill.

DR. NATHAN B. VAN ETTEN:

- April 9—Tennessee Medical Association, Chattanooga.
- April 21—Minnesota State Medical Society, Rochester, Minn.
- April 24—Nebraska State Medical Society, Lincoln.
- April 29-30—Missouri State Medical Society, Joplin.

DR. PAUL C. BARTON:

- April 5—Central High School, Superior, Wis.
- April 5—East High School, Superior, Wis.
- April 5—Women's Club, Superior, Wis.

WOMAN'S AUXILIARY

Arkansas

Dr. Thomas P. Foltz, president of the Sebastian County Medical Society, discussed socialized medicine at a recent meeting of the woman's auxiliary in Fort Smith. The auxiliary has given subscriptions of *Hygeia* to the Girls' Club, to the Rosalie Tilles Children's Association, to the Carnegie Library and to several rural schools in the Fort Smith area. It has made donations also to the state loan fund for medical students.

Mrs. C. E. Kitchens, president of the auxiliary to the Arkansas Medical Society, spoke at the November meeting of the auxiliary to the Union County Medical Society on the aims and purposes of the medical auxiliary and its program for the year.

The auxiliary to the Southeast Arkansas Medical Society met in Dermott November 20, when the physicians entertained forty-six members of the medical society and the auxiliary at dinner in the Methodist Church. A fund was given for purchasing fruit for the children's homes at Monticello.

The auxiliary to the Washington County Medical Society is preparing linens and garments for patients at the hospital in the county.

Florida

Mrs. L. C. Ingram, president of the auxiliary to the Florida Medical Association, addressed the third annual meeting of the North Central Medical District in Ocala recently. Mrs. Julian N. Tolar, Sanford, was elected president of a newly formed auxiliary to the South Central medical district.

The auxiliary to the Polk County Medical Society met in Winter Haven November 11. Articles from the *Bulletin* of the Woman's Auxiliary to the American Medical Association and from *Hygeia* were read and attention was called to the American Medical Association's broadcast over the National Broadcasting Company on "Medicine in the News."

The auxiliary to the Duval County Medical Society regularly entertains the doctors with dinner preceding meetings. At a recent meeting of the auxiliary in Jacksonville, Dr. Edward Jelks spoke on state medicine.

Indiana

Sixty members of the auxiliary to the Allen County Medical Society were entertained recently at the Irene Byron Tuberculosis Sanitarium near Fort Wayne. In October the auxiliary was hostess at the annual meeting of the auxiliary to the Indiana State Medical Association.

An auxiliary to the Morgan County Medical Society was organized at Martinsville, December 13. Mrs. Patrick Murphy of Morgantown was elected president. Speakers were Mrs. William E. Tinney, president of the auxiliary to the Indiana State Medical Association, and Mrs. Fred Wishard, its organization chairman. An auxiliary to the Carroll County Medical Society was organized in Delphi, December 12. Mrs. Charles Crampton was elected president.

Seventy members attended the meeting of the auxiliary to the Marion County Medical Society in Indianapolis, January 8. Mrs. Bjorn Winger spoke on "The Norwegians at Home," and Mrs. William E. Tinney, president of the auxiliary to the Indiana State Medical Association, discussed the policies of the auxiliary.

Iowa

The Seventh Annual Health Essay Contest, sponsored by the auxiliary to the Iowa State Medical Society and the speakers bureau of the society, for high school students in Iowa opened January 10 and will close March 15. The subject of the essays is "The Road to Health." The judges will be members of the state department of public instruction, the state department of health, the Iowa State Medical Society and the auxiliary to the Iowa State Medical Society.

Michigan

The auxiliary to the Bay County Medical Society was entertained recently by the auxiliary to the Saginaw County Medical Society in Saginaw.

The auxiliary to the Calhoun County Medical Society met in Battle Creek November 7. The auxiliary has contributed

\$100 to each of the following: the Hannah Swift Memorial for the nurses of Community Hospital, the fund for crippled children of Calhoun County and the Christmas activities of the Michigan Children's Aid Society. The auxiliary contributed \$10 to the Nurses' Training School of each hospital at Christmas time.

The auxiliary to the Eaton County Medical Society held its November meeting in Charlotte. A project of the auxiliary is to raise funds for the Home Delivery Service of the Eaton County Health Department.

The auxiliary to the Genesee County Medical Society met in Flint November 29 and contributed \$93 to the Red Cross and also sent food and clothing to needy families, both at Thanksgiving and at Christmas. Members of the auxiliary to the Jackson County Medical Society are cooperating in the Red Cross emergency call by knitting garments for Polish refugees.

New Hampshire

The auxiliary to the Rockingham County Medical Society met at the Portsmouth Hospital, Portsmouth, recently. Mrs. Emery M. Fitch, president of the auxiliary to the New Hampshire Medical Society, was guest speaker.

The auxiliary to the Belknap County Medical Society met with the county medical society at Campton November 14. Following dinner at the Baptist Church, the auxiliary assembled at the home of Mrs. Webb Little, who gave a talk on old New England glass. The chief project of the auxiliary is giving prizes to student nurses at the Laconia Hospital in Laconia.

The auxiliary to the Hillsboro County Medical Society met in Milford November 14. Mrs. Robert Flanders discussed *Hygeia* and Mrs. Harry Morse, public relations.

The Benevolence Fund of the medical society is the chief project of the ten auxiliaries in New Hampshire. The officers of the state auxiliary have requested that the members read articles especially pertaining to medical legislation.

New York

Presidents elected at recent annual meetings of county auxiliaries in New York are as follows: Mrs. G. C. Sincerbeaux, Cayuga; Mrs. W. D. Collins, Columbia; Mrs. E. M. Neptune, Onondaga, and Mrs. F. W. Seward, Orange.

South Dakota

The auxiliary to the Watertown District Medical Society met in Watertown December 15. Mrs. Finn Koren, Watertown, was elected president.

West Virginia

The auxiliary to the Cabell County Medical Society met in Huntington November 13. Dr. Arthur E. McClue, state health commissioner, spoke on "The Social Security Act and Its Relation to the West Virginia Worker"; Dr. Raymond Sloan discussed "City Clinics."

The auxiliary to the Fayette County Medical Society met in Montgomery recently. Mrs. H. F. Troutman discussed "Socialized Medicine."

Dr. W. P. Hamilton, health officer of Logan County, spoke on "Periodic Health Examinations" before the auxiliary to the Logan County Medical Society, Logan, December 5.

Mrs. V. E. Holcombe, president, auxiliary to the West Virginia State Medical Association, addressed the auxiliary to the Marion County Medical Society at the October meeting in Fairmont. The auxiliary celebrated its tenth anniversary with a dinner in Fairmont November 28.

Miss Esther Finley, R.N., spoke on "What the Red Cross Means to Our Community" at a meeting of the auxiliary to the Parkersburg Academy of Medicine December 12.

The auxiliary to the Harrison County Medical Society met in Clarksburg December 7. Adjutant Morris, of the Salvation Army, and Mrs. Walraven, of Charleston, discussed the needs of "The Crippled Child"; Mrs. Corinne Bunn spoke on "Maternal Health."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Hospital Meeting.—The Arizona Hospital Association held its annual meeting at the Adams Hotel, Phoenix, February 2-3. Dr. Clarence G. Salsbury, Ganado, gave the presidential address on "The Arizona Hospital Association, Its Scope and Purpose." Other speakers included:

Paul Elliott, D.D., Group Hospitalization, Its Plan and How It Works.
Mr. J. O. Sexson, superintendent, Good Samaritan Hospital, Phoenix, The Development and Management of Hospital Personnel.

Dr. Roland A. Davison, medical director, The Desert Sanatorium and Institute of Research, Tucson, The Importance to Hospitals of Good Public Relations Education.

Dr. Charles A. Thomas, medical superintendent, Southern Pacific Sanatorium, Tucson, Responsibility of the Hospital for Health Education and First Aid Programs.

COLORADO

Society News.—The Fremont County Medical Society was addressed recently by Dr. Irvin I. Schatz, Pueblo, on encephalitis.—Dr. Karl F. Arndt, Denver, addressed the Otero County Medical Society at La Junta, March 21, on cardiac insufficiency.—The Pueblo County Medical Society was addressed, March 19, by Dr. Merrill W. Michels, Pueblo, on "Osteomyelitis of Skull and Sinuses." Dr. John B. Farley, Pueblo, discussed "Water Balance in Surgery" before the society, March 5.—Dr. Edward R. Mugrage, Denver, addressed the Northeast Colorado Medical Society, March 14, on "The Leukemias" and Dr. Kenneth C. Sawyer, Denver, "Surgical Lesions of the Stomach and Duodenum."—A symposium on venereal disease was presented before the Medical Society of the City and County of Denver, April 2, by Drs. Charles Smith, Osgoode S. Philpott and Henry A. Buchtel. The society was addressed, March 5, by Drs. Wilfred S. Dennis on "Organic Lesions of the Colon" and Solomon S. Kauvar, "Functional Disorders of the Colon."

FLORIDA

Changes in Health Officers.—Dr. Robert J. Lamb, formerly of Jacksonville, has been appointed health officer of Franklin and Gulf counties, succeeding Dr. Derric C. Parmenter. His headquarters will be in Apalachicola. Dr. Clayton A. Adams Jr., formerly of Trenton, has been appointed health director of Jackson County, with headquarters in Marianna.

Society News.—Bradley M. Patten, Ph.D., Ann Arbor, Mich., presented a micro-moving picture of living embryos showing the development of the circulatory system before the Dade County Medical Association in Miami, February 6.—Dr. Francis A. Copp discussed "Plastic Surgery" before the Duval County Medical Society in Jacksonville, March 19, and Dr. Lucien Y. Dyrenforth conducted a clinical pathologic conference.

GEORGIA

State Medical Meeting at Savannah.—The annual meeting of the Medical Association of Georgia will be held at the Hotel DeSota, Savannah, April 23-26, under the presidency of Dr. William H. Myers, Savannah. The program includes the following speakers from out of the state:

Dr. Kenneth M. Lynch, Charleston, S. C., Progress in Knowledge and Control of Cancer.

Dr. Lloyd Noland, Birmingham, Ala., The Function of the Industrial Physician.

Dr. Frank H. Lahay, Boston, Thyroid Disease.

Dr. Rollin T. Woodyatt, Chicago, will present the Abner Wellborn Calhoun Lecture Wednesday on "Newer Phases of the Diabetic Problem" and Dr. Myers the presidential address Thursday on "Medicine: Yesterday and Tomorrow." The annual banquet with Dr. Julian K. Quattlebaum, Savannah, as toastmaster, will be addressed by Dr. Morris Fishbein, Chicago, on "American Medicine and the National Government." A symposium on the problems of medical care in Georgia will be conducted by Drs. Cyrus W. Strickler, Thomas F. Abercrombie, Charles W. Roberts, Alfred A. Weinstein, James E. Paullin, all of Atlanta; Benjamin H. Minchew, Waycross;

Alfonso J. Mooney, Statesboro; Enoch Callaway, LaGrange, and Clarence L. Ayers, Toccoa. A symposium on obstetrics will be presented by Drs. James R. McCord, Atlanta; H. F. Sharpley Jr., Savannah; Edward Carson Demmond, Savannah; Richard Torpin, Augusta; Rudolph A. Bartholomew, Atlanta, and Otis R. Thompson, Macon. The woman's auxiliary will meet April 23-25.

IDAHO

Society News.—The Pocatello Medical Society was addressed February 1 by L. F. Bracken, manager, State Insurance Fund of Idaho, on the state industrial insurance program and by Dr. William F. Howard, "Hormones and Vitamins."

New State Health Director.—Dr. Ernest L. Berry, Buhl, has been appointed state director of health, according to *North-west Medicine*. He succeeds Dr. Howard L. McMartin, Boise, who has been acting director. Dr. Berry graduated at Northwestern University Medical School, Chicago, in 1918.

IOWA

Dr. Fay Donates Library.—Dr. Oliver J. Fay, Des Moines, has given his medical library, consisting of more than 1,500 volumes, to Iowa Methodist Hospital. A library board has been established, composed of Drs. Joseph B. Priestley, Thomas A. Burcham, Christian B. Luginbuhl, James E. Kahler and Mr. Robert A. Nettleton, the last two being ex officio members. They are the hospital pathologist and superintendent respectively. Mrs. S. D. McFadden has been librarian on a full time basis. Dr. Walter L. Bierring, state health commissioner, has added 225 volumes to the collection and Dr. Joseph A. Goodrich fifty-five volumes.

KANSAS

Personal.—Dr. David D. Holaday, formerly of Osage City, has been appointed full time health officer of Marion County.—Dr. Joseph W. Spearing, formerly of Cimarron, has been appointed health officer of Cherokee County with offices in Columbus.

Society News.—The Sedgwick County Medical Society was addressed in Wichita, February 6, by Drs. Vern L. Pauley on "Problems in Thyroid Surgery" and Theodore W. Weaver and Wilbur G. Gillett, "Lesions of the Visual Pathways." All are of Wichita.—The Lyon County Medical Society was addressed in Emporia, February 6, by Drs. James H. Danglede, Kansas City, Mo., on "Use and Abuse of Certain Cardiac Drugs," and Ferdinand C. Helwig, Kansas City, "Certain Medicolegal Aspects of Acute Alcoholic Intoxication."—The Shawnee County Medical Society was addressed, March 4, by Drs. Clyde B. Trees on "Use of Carrel-Dakin Solution in the Treatment of Compound Fractures"; Leo A. Smith, "Perianal and Perirectal Infections," and George F. Helwig, "Blood Transfusions." All are of Topeka.

MASSACHUSETTS

Dr. Bunker Named Dean at Institute of Technology.—John W. M. Bunker, Ph.D., director of the research laboratories of biology and professor of biochemistry and physiology, Massachusetts Institute of Technology, Cambridge, has been appointed dean of the graduate school, it is announced. As director of the biological division of Digestive Ferments Company, Detroit, 1915-1921, he is credited with establishing the first source of supply of dehydrated bacteriologic culture mediums now used in bacteriologic laboratories throughout the world.

Dr. McKhann Goes to Michigan.—Dr. Charles Fremont McKhann, associate professor of pediatrics and communicable diseases, Harvard Medical School and the Harvard School of Public Health, Boston, has been appointed professor and head of the department of pediatrics and communicable diseases at the University of Michigan Medical School, Ann Arbor. He succeeds the late Dr. David Murray Cowie. Dr. McKhann graduated at the University of Cincinnati College of Medicine, Cincinnati, in 1923. He became associated with Harvard in 1929 and from 1935 to 1936 served as visiting professor of pediatrics at Peiping Union Medical College, Peiping, China. He once served as president of the Society of Pediatrics Research.

Society News.—Dr. Michael J. Kranichuck, South Hamilton Falls, retiring president, addressed the Eastern Hampshire Medical Association at its sixtieth anniversary meeting, February 29, in Springfield on "Rocky Mountain Spotted Fever." Dr. Richard E. Dickson, Holyoke, the oldest living member

of the society, delivered a paper tracing the history of the association from its beginning in the home of Dr. R. E. Ballard, Monson, with two members, up to the present time. The by-laws provided that the meetings should be held monthly "on the Thursday preceding the full of the moon." The moonlight was needed for the homeward drive. This custom has been maintained.—Dr. John P. Hubbard, Boston, among others, addressed the New England Heart Association, February 26, on "Paroxysmal Tachycardia and Its Treatment in Young Infants."—At a meeting of the Worcester District Medical Society, March 13, the speakers were Drs. Roger W. Robinson on "Sulfapyridine" and Robert M. Zollinger, Boston, "Acute Cholecystitis."

MICHIGAN

Hospital News.—The University Hospital Clinical Society, Ann Arbor, which ceased to function in 1925, was to be reorganized at a meeting, February 7. Its purpose is to stimulate a closer relationship between the various clinical staffs of the hospital and encourage the younger staff members in the preparation and presentation of clinical and technical material.

Industrial Meeting.—The Michigan Association of Industrial Physicians and Surgeons will hold its annual meeting in Grand Rapids, April 17. The speakers will include:

Dr. Elston L. Belknap, Milwaukee, Silicosis—Wisconsin Plan.
Dr. Frederick W. Slobe, Chicago, Injection Treatment of Hernia.
Dr. Chester B. McVay, Ann Arbor, Operative Treatment of Hernia.
Dr. Kenneth E. Markuson, Lansing, Integration of Industrial Medicine with Hygiene.
Dr. Elisha S. Gurdjian, Detroit, Nerve Injuries.

At the annual dinner, Dr. Paul B. Magnuson, Chicago, will deliver an address on "Low Back Pain."

Society News.—Dr. Julius H. Hess, Chicago, addressed a joint meeting of the Wayne County Medical Society and the Detroit Pediatric Society, March 11, on "Bronchiectasis in Childhood."—Dr. Alan C. Woods, Baltimore, addressed the Detroit Ophthalmological Society, March 21, on "Ocular Tuberculosis."—The Ingham County Medical Society was addressed in Lansing, February 20, by Dr. Joseph A. Johnston, Detroit, on "Childhood Tuberculosis."—The Michigan Society of Neurology and Psychiatry was addressed in Ann Arbor, March 14, by Drs. Dayton D. Salom on "Spontaneous Subarachnoid Hemorrhage"; Ralph M. Patterson, "Some Considerations of Forensic Psychiatry in Michigan," and Edgar A. Kahn, "Use of a Contrast Medium (Thorotrast) in the Surgical Approach to Cystic Lesions of the Brain."

Physicians Honored.—Two physicians were honored at a meeting of the Academy of Surgery of Detroit, February 8, one posthumously. The meeting was a memorial to Dr. Frank B. Walker, who died in 1927, and included the unveiling of a portrait of him painted by William Glason. Dr. Walker graduated at the Detroit College of Medicine and Surgery and was associated with it for thirty-one years, serving, among other things, as registrar and professor of operative surgery. At this meeting Dr. Don W. McLean was honored for having received recognition at the session of the American Academy of Surgery in October 1939 in Philadelphia, where he was presented with a life membership for having prepared "the finest case history of the year." According to *Detroit Medical News*, his local confreres voted to establish Dr. McLean as a regular member of the Detroit academy and conferred a membership certificate extending to 1945.

MISSOURI

Society News.—The Missouri-Kansas Neuropsychiatric Association opened its annual meeting, February 21, in Kansas City with a round table discussion on "The Nutritional and Metabolic Factors in Neuropsychiatric Disorders." The speakers included Drs. Walter Freeman, Washington, D. C., on "The Wincing Reaction"; Herbert Randolph Unsworth, New Orleans, "Emotionalism in Disease"; George T. Harding, Columbus, Ohio, "The Treatment of Psychiatric Patients in the Private Hospital"; Abe Hauser, Houston, Texas, "Non-specific Protein Therapy of Neurosyphilis," and, in the evening, Dr. Maurice N. Walsh, Rochester, Minn., "Low Back Pains—Sciatica and Protrusion of the Intervertebral Disk."—Dr. Francis G. Blake, New Haven, will address the Kansas City Academy of Medicine, April 19, on "Chemotherapy in Respiratory Diseases." Dr. Allen O. Whipple, New York, addressed the academy, March 15, on "The Application of Chemistry to Certain Problems in the Preoperative and Post-operative Care of Surgical Patients."

Joint Industrial Meeting.—The Central States Society of Industrial Medicine and Surgery and the St. Louis Medical Society held a joint program on industrial medicine and surgery at the Statler Hotel, St. Louis, February 9. Included among the speakers were:

Dr. Garold V. Stryker, St. Louis, Occupational Dermatitis.
Dr. Oscar P. Hampton Jr., St. Louis, Sulfanilamide Treatment of Infections.
Dr. John Albert Key, St. Louis, Treatment of Compound Fractures.
Dr. Theodore L. Hansen, Chicago, Treatment of Burns and Their Complications.
Dr. William T. Coughlin, St. Louis, Diagnosis and Treatment of Head Injuries.
Dr. Leonard T. Furlow, St. Louis, Diagnosis and Treatment of Pathology of the Nucleus Pulposus.

A symposium on differential diagnosis of back conditions and pain was presented by Drs. Cyrus E. Burford, St. Louis; Frank D. Dickson, Kansas City, and Frederick W. Slobe, Chicago. After-dinner speakers were Drs. Clarence D. Selby, Detroit, on "The Dividends of Industrial Medicine and Surgery" and Edgar V. Allen, Rochester, Minn., "The Health of the Executive."

NEW JERSEY

Dr. Albee Honored.—Dr. Fred H. Albee of New York and Colonia was honored at a dinner dance at the Essex House, Newark, February 21, as a testimonial to his work as chairman of the Rehabilitation Commission of New Jersey for twenty years. The affair was sponsored by the state department of labor and rehabilitation. The toastmaster was William J. Egan, assistant attorney general, and the speakers were state officials. Governor Moore, unable to attend because of illness in his family, sent a message of thanks to Dr. Albee for his long gratuitous service. Dr. and Mrs. Albee received a silver service as a gift, and an oil portrait of Dr. Albee was presented to Mrs. Albee. The state rehabilitation service grew out of the organization and development of the same type of service to soldiers during the World War, when Dr. Albee was surgeon in chief of U. S. General Hospital No. 3 at Colonia.

NEW YORK

Retail Sale of Sulfanilamide Restricted.—The state board of pharmacy has promulgated a new rule requiring that sulfanilamide, sulfapyridine, their derivatives and mixtures containing them be sold only on the prescription of a physician. The prescription shall remain on file in the pharmacy and is not to be refilled if it bears indication by the physician to that effect.

White Plains Hospital Opened.—The new \$1,000,000 plant of the White Plains Hospital was recently occupied. The capacity of the hospital is now 176 beds and twenty-two bassinets. Of the \$900,000 construction cost, about \$350,000 was contributed by Mr. Clarion B. Winslow, White Plains; \$275,000 was raised on a mortgage and the remainder by public subscription. The additional cost of equipment was met by another appeal to the public.

Society News.—Dr. Henry M. Thomas Jr., Baltimore, addressed the Broome County Medical Society, Binghamton, March 12, on "Hypertension, Its Clinical Significance and Treatment."—The New York State Association of Public Health Laboratories will hold its twenty-fourth annual meeting at the University of Rochester School of Medicine and Dentistry, May 20.—Dr. Frederick A. Collier, Ann Arbor, Mich., addressed the Rochester Academy of Medicine, March 6, on "Fluid and Electrolyte Balance in the Surgical Patient."—Dr. Wilson G. Smillie, New York, addressed the Medical Society of the County of Monroe, Rochester, March 19, on "Trends in Public Health."

New York City

Medical School News.—Dr. Russell L. Cecil, professor of internal medicine at the New York Polyclinic Medical School and Hospital, will give a special lecture at the school, April 10, on pneumonia. A special clinic for the hard of hearing has been established at the hospital under the direction of Dr. Samuel J. Kopetzky.

Meeting on Forensic Medicine.—The Medical Society of the County of Queens held a joint meeting with the Queens County Bar Association, March 26. The speakers were Robert F. Wagner Jr., state senator, on "The Doctor and the Lawyer"; Dr. Thomas A. Gonzales, chief medical examiner of New York City, "The Relation of the Medical Examiner's Office to the Public, the Law and Medicine," and Charles P. Sullivan, district attorney of Queens County, "The Role of the Physician in the Prevention of Crime."

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 2, 1940.

Medical Research in the War

The annual report of the Medical Research Council points out that war conditions offer special opportunities for the acquisition of knowledge which is by no means of merely emergency interest. In the last war the council set up special committees under the chairmanship of leading men which did important work on surgical shock, chemical warfare, anaerobic bacteria and infections, air medical investigations, and anaerobic and bacillary dysentery. During the two years preceding the present war the council was entrusted by the government with a number of responsibilities. It was asked to undertake the organization and supply of certain antitoxins to be held in readiness for war purposes, particularly tetanus and gas gangrene antitoxins. It was clear that these would be required out of all proportion to normal requirements. Provision was also made for various vaccines and serums which might be required for dealing with epidemics. The council has undertaken the registration of all pathologists and medical bacteriologists and of technicians in those subjects who may be required for war service. The register will serve as a source of information when emergency posts have to be filled and at the same time help to prevent the removal of essential personnel from work which continues to be important in war time.

EMERGENCY PUBLIC HEALTH LABORATORY SERVICE

The chief task entrusted to the council is the organization of an emergency laboratory service to provide against the increased danger of epidemics resulting from evacuation schemes and other movements of population and from disorganization of normal arrangements. At the outset of the war three central and sixteen subsidiary laboratories were formed. Accommodation was found at universities and public schools.

BLOOD TRANSFUSION DEPOTS

The council organized four depots in the neighborhood of London to augment the arrangements made by the hospitals for the collection and supply of blood for transfusion. The council also assisted in coordinating the work of the hospitals and in providing them with apparatus. Advice was also given to those locally responsible for blood transfusion schemes in other parts of the country. The depots were mobilized at the beginning of the war and have since been maintained in a state of readiness. Though primarily for civilians, some have already supplied the army. New uses have been found for blood stored for transfusion for its maximum time without being required. In particular, part is being recovered for use as a prophylactic against measles, in view of the fact that the serum of most adults has power of conferring resistance against the disease.

NUTRITION IN TIME OF WAR

During the last war knowledge of nutrition was acquired which has proved of value in dealing with questions of the nation's food supply in conditions of restriction. It is vital that this knowledge be applied now if similar conditions recur. In the meantime, however, the facts have become more widely known and the importance of qualitative as well as quantitative rationing is generally realized. The special need for milk and other protective foods is an example. Scientific guidance is essential in all measures affecting the food supply of the armed forces and the population at large, if the best results are to be obtained. Great use is now made of canned foods in service rations, which raises the question of destruction of vitamins in the process. This and other points in army rations are now being investigated. So also are methods for the preservation of food during transportation and storage.

WAR PROBLEMS

The council has appointed a special committee to review the question of shock after severe wounds and operations and to organize both laboratory and clinical studies on the subject. Related to this is the question of blood transfusion, with regard to which various investigations are in progress. The great development of chemotherapy for bacterial infections gives hope for the treatment of the sepsis of war wounds. The new method will, however, need to be carefully controlled at first so that the results can be evaluated. The council has released the member of its scientific staff who has been most closely concerned with work on this subject, Colonel Colebrook, in order that he may become consulting pathologist to the British expeditionary force. He will have the cooperation at home of a special laboratory unit to investigate streptococcal infections of wounds, including civilian as well as military casualties.

The Care of War-Blinded Civilians

After the last war a well known journalist, Sir Arthur Pearson, who himself had become blind, founded St. Dunstan's Institute for Blinded Soldiers. St. Dunstan's has done great work for these men, not only providing medical care but training them in occupations and modes of recreation suitable for the blind. In no other country has such complete provision been made for blinded soldiers. War blinded civilians have now to be considered because of air raids on cities. The minister of health, Mr. Walter Elliot, has received a deputation representing the National Institute for the Blind and the Joint Blind Welfare Committee of the Associations of County Councils and Municipal Corporations, on the provision to be made for the education, training, employment and general welfare of civilians blinded as the result of war. The deputation pointed out that the whole country is covered by voluntary societies working in close cooperation with the local authorities responsible for the welfare of the blind under the Blind Persons acts, who had established a system which meets the needs of the blind more comprehensively than any similar system in the world. They came to the minister to discuss the national scheme which they had prepared for adapting the existing facilities to war requirements and, if need be, extending them to meet the needs of civilians blinded by enemy action. The minister said in reply that he wanted to secure the best possible treatment for all blind persons. He had recently arranged with St. Dunstan's under the Emergency Hospital Scheme, to undertake the hospital treatment of civilian adults. The whole cost would be borne by the government. The rehabilitation and reeducation would be undertaken by the National Institute for the Blind.

BERLIN

(From Our Regular Correspondent)

Feb. 9, 1940.

News of the Universities

Nearly all German universities have either reopened or will reopen shortly. The trimester system is now in force. The first trimester lasts from January 8 to March 21, the second from April 15 to July 31 and the third from September 2 to December 20. According to the national department of education the same achievements are expected though the training time has been reduced. The student can now complete within two years studies that formerly required three years. The training especially of physicians and engineers is being pushed during the war. The universities have been set special tasks according to the availability of scientific laboratories locally. Emphasis is on speeding up the educational process. Leisure is sacrificed. Whether the same quality of training can be achieved within a shortened time is highly problematic. The trimester was used only once in the history of German universities: after the World War, to assist students to recover lost time. After a single experiment the plan was discor-

tinued. The German medical curriculum is perhaps now shorter than that of any other country in the world.

Such revolutionary changes were not suddenly thrust forward during the war but have their basis in the altered significance attached to culture and scholarship since nazism, with its brutal subordination of all phases of German life to its partisan ideology, forced its way into power. Culture and scholarship were once Germany's highest ideals. Today they have been replaced by the political philosophy that characterizes the nazi régime. Education and scholarship are now tools to serve the political purposes of the party in power. This is publicly stated and appears even in print. Utterances like those of Rust, who heads Germany's department of education, toward the close of last year in Munich on the occasion of a university festivity are significant. He referred to "freedom of research" as a "premise" not a "privilege." All these factors indicate how thoroughly the academic assumptions that previously prevailed in Germany have been debased.

According to an official report from the office of the student leader of the reich, there are at present 1,941 foreign students in Germany representing the following countries: Bulgaria 532, Norway 142, Greece 101, with Yugoslavia, Italy, China, the Baltic states, the Scandinavian countries and the United States showing smaller numbers.

New regulations governing the writing of doctoral dissertations and examinations for the doctor's degree have just been issued by the national department of education. "In order to protect national socialist publications" in the preparation of doctoral dissertations the official examining commission of the nazis will be included to pass on dissertations that in any wise deal with the national socialist movement or party. This commission is authorized to propose changes and may even prohibit publication. Moreover, when authors of Jewish extraction are quoted in dissertations they must be so designated. In bibliographies, Jewish writers must be listed separately. The citation of Jewish writers must be reduced to the utmost; that is, citation should be made only if scientifically indispensable.

Diphtheria in 1938

An official report of the state health department on the incidence of diphtheria in Germany (exclusive of Austria) in 1938 seems to indicate its increase, as the following tabulation shows:

Year	Number of Cases	Per 10,000 Inhabitants	Per Cent of Mortality
1933.....	74,559	11.4	4.9
1934.....	113,936	17.5	4.2
1935.....	132,930	19.9	4.4
1936.....	147,029	22.0	3.8
1937.....	146,733	21.8	3.7
1938.....	149,424	22.0	3.5

These figures show an increased morbidity but a diminished mortality. In Austria, morbidity fell from 28.9 per 10,000 inhabitants in 1937 to 25.3 in 1938. About 85 per cent of the cases occurred within the age level of 0 to 15. This accounts for the greater frequency in sections with large families. The increase of diphtheria has led to intensified prophylactic measures.

Control of Barbitol Derivatives

Great attention is paid in Germany to the growing use of hypnotics. According to a new order, barbitol and its derivatives are now placed under strict control. Barbitol derivatives, their salts and molecular combinations and the preparations made from them may be bought in drug stores only on medical prescriptions. The directions on the prescription must clearly indicate the single dose and the total dose for the day. If the diethyl, diallyl, dibrompropyldiethyl, dipropyl or phenylethyl derivatives and their salts are prescribed, the prescrip-

tion may be only once filled by the patient. Prescriptions of barbitol derivatives not included in this group may be renewed during the period of six months unless the prescription bears the notation "no renewal permitted." The prescription may contain also restrictions such as "may be renewed three times within two months." The regulations govern also the so-called molecular combinations of barbitol and its derivatives with phenyldimethylpyrazolon or dimethylaminophenyldimethylpyrazolon and their preparations. In ready made preparations containing barbitol derivatives, the wrapper, the directions and all advertisements must clearly indicate the barbitol content.

OSLO

(From a Special Correspondent)

March 3, 1940.

Public Health in the North of Norway

Arctic Norway is to southern Norway what Siberia is to the rest of Russia—the abomination of desolation. Almost incredible poverty, arctic cold and darkness, and storms at sea taking a heavy toll of life make this part of the world most unattractive except from a safe distance or for a brief spell in the summer. To keep the medical services going in the North, the director of medical services sent recently qualified doctors north on the understanding that when they have served a term of a few years there they shall be rewarded with more profitable and congenial appointments as medical officers of health farther south. Now and then a young doctor finds life in the North so attractive that he remains there till old age overtakes him. Such a career is by no means desirable, least of all for the community, for such lifelong isolation almost inevitably implies scientific stagnation.

Of late years a remarkable change has come over these young doctors sent north. Instead of devoting themselves exclusively to clinical work while they gain seniority and wait for promotion south, they are now taking an active interest in public health work such as the periodic medical examination of school children and wholesale tuberculin and radiologic surveys. Occasionally reports of such surveys appear in the Journal of the Norwegian Medical Association, doubtless to the boredom of the old fashioned clinician but stimulating to the apostles of preventive medicine. Such a report has recently been made by Dr. J. Bremer and Dr. H. Lid. It is disquieting, for it shows that among several hundred school children between the ages of 8 and 15 the state of general nutrition was unsatisfactory in about 20 per cent. The same proportion suffered from underweight to a marked degree and 55 per cent were under the ideal weight. The teeth were poor in 64 per cent, and over 7 per cent suffered from rickets. Between 13 and 14 per cent were already tuberculin positive. A survey such as this should prove most valuable as a standard for comparison a generation or two hence when, let us hope, great strides will have been made. For the present we must be glad that we have at least learned what crying need there is for improving the conditions under which the present generation is growing up in the North of Norway.

Wartime Organization of the Medical Services

As preparations for war have proceeded in the medical services, it has become abundantly clear that there must be pooling of resources if the three bodies concerned are to avoid overlapping. These three bodies are (1) the medical services of the army and navy, (2) the civilian air defense service and (3) the ministry of health with its well established public health organization throughout the country. No civilian hospital is to be taken over so completely by the army or navy that civilian cases will be excluded altogether. Arrangements have already been made for converting certain buildings, hitherto used for quite other purposes, into emergency hospitals. The civilian air defense service is under the ministry

of justice and is made up of thirty administrative districts, each with a chief who is the head of the police in the same district. This body is responsible for the evacuation of civilians, fire services, repairs to waterworks, gas defense and the medical care of the injured. A committee of three is responsible for this last activity and must provide first aid for casualties in improvised hospitals, e. g. schools and the like already earmarked for this purpose.

It should be evident that the second of the three medical bodies is quite a new creation sandwiched in between the old established medical services of the fighting forces and the old established civilian services in the charge of the senior public health officer of the country. It would only be human were the directors of the already established medical services to look askance at this newcomer. But good sense has prevailed and a *modus vivendi* evolved for the avoidance of administrative wastage. The heads of the three bodies met in conference toward the end of the year and agreed on the creation of a central committee which officially came into being January 13. The director of medicine, Dr. K. Evang, is the chairman of this committee, whose other members are Col. O. Svenneby, head of the army medical service, Dr. H. Engelsen, head of the navy medical service, Dr. G. Johnson, representing the civilian air defense service, and Dr. A. Christensen, representing the association of hospital doctors. The only youthful figure on this committee of veterans is its chairman.

When Does a Doctor Become a Specialist?

Only a generation ago, your title to be called a specialist mainly depended on yourself, on your own opinion of yourself as a specialist. You studied a certain subject with special diligence at home and abroad, and when you settled down in practice in some town you let it be known quite informally that you were specially interested in such and such a subject. Now all this is changed and the term specialist has come to be not only hard earned but also conferred by some authority which is far more critical of your qualifications than you would be yourself. Indeed, it is hardly going too far to say that the title of specialist is hedged in by as strict official requirements as the title of doctor itself.

At present the title of specialist is conferred by the specialist committee, which consists of one of the professors in surgery, two medical superintendents of large hospitals, the medical superintendent of a small hospital, and a well known surgeon in private practice. A case, recently ventilated in the medical press, gives a good idea of the high standards required of the wouldbe specialist in surgery. The young man in question completed his medical curriculum with honors (*laudabilis*). He was then an intern for half a year and assistant surgeon for one year at a provincial surgical hospital of high standing. Then he served for twelve months in various capacities in the Rikshospital, which is attached to the University of Oslo. There followed sixteen months' service as assistant doctor at the naval hospital. Then he was appointed medical officer of health in the North of Norway, where he was in charge of a forty-two bed hospital. Three years later he served for two years as assistant doctor in a large provincial hospital. With all this general and surgical hospital experience, he put in his application for the title of specialist in surgery. It was refused him although more than five of his postgraduate years had been spent in hospitals the functions of which were mainly surgical.

There would assuredly be less heart burning over cases such as this if the qualifications required of a specialist were to be more strictly defined and better known than they are at present. In its decisions, the specialist committee is, to a considerable extent, influenced by the size and importance of the hospitals in which wouldbe specialists serve their apprenticeship. This tendency is quite understandable. But it also means that young wouldbe surgeons under its influence are inclined to avoid all

but the largest hospitals, with the unfortunate result that the smaller hospitals get only the second best in the matter of interns and assistants.

Aid from Norwegian Doctors for Finland

By the middle of February some thirty Norwegian doctors were already at work in Finland, attached to hospital services in different parts of the country. Norwegians are keen not only on sending doctors to Finland but also on providing their salaries; and to this end Norsk Folkehjelp is appealing to the medical profession to subscribe the wherewithal for the remuneration of these thirty doctors. Another association, Foreningen Norden, is working in unison with the Norwegian Red Cross with a view to helping Finland financially in various ways. One of them is to persuade professional bodies such as the Norwegian Medical Association to agree to give the whole of one day's earnings to Finland.

AUSTRALIA

(From Our Regular Correspondent)

Feb. 28, 1940.

Nursing in the Bush

The Victorian Bush Nursing Association represents one of the most interesting public health movements of recent times. A little over thirty years ago the countess of Dudley, wife of the then governor-general of Australia, noticed that the inhabitants of the enormous country districts of Victoria had no trained nurses. When the scheme to provide them was first proposed, the medical profession objected because it feared competition, the nurses were openly hostile, and the public was afraid it would be called on to maintain another charity. The association has issued its twenty-eighth annual report. It reveals the great variety of medical institutional work which was carried on successfully in 1938-1939 in the state of Victoria, comprising local and district nursing relief and including work in hospitals as well as among isolated communities in the bush regions. The Bush Nursing Association has now extended far beyond the state of Victoria. It is essentially a cooperative concern, each center managing its own affairs. It does not publish any propaganda but gives support when a wish to form a center is expressed by the local residents and medical practitioners, all such centers being independent and self supporting. There are now fifty-one hospitals and three more are being built. There are nineteen bush nursing centers also. The central council remarks that few city dwellers realize the desire of people of independent mind to provide in their own districts modern and well equipped hospitals, owned and managed by themselves, staffed by their own doctors and by the best nurses in the state, and provided at very low rates. Hospital extensions are often found necessary after their first building by reason of the enthusiasm which results; some have had financial difficulties in carrying on, but in most cases they are all paying their way without help from outside. Had the cooperative system of nursing in the bush not been developed originally, it is doubtful whether the system could have been transferred later to the rural hospital centers. The local inhabitants regard their subscriptions as a form of insurance; one hospital closed its doors five years ago to non-subscribers and is thoroughly satisfied with the result, so much so that a second hospital has followed this example. A few hospitals have been forced to close by shortage of medical practitioners, and if more practitioners were available the number of hospitals could be much increased. Bush nursing hospitals may not be established within 20 miles of the nearest city. A fundamental feature of these hospitals is that they take cognizance of persons before they become actually ill. The rate charged for care in hospitals depends on the number of subscribers; if there are from 100 to 150 subscribers the charge can be lowered to about £2 a week, and if there are

enough subscribers it falls to 10 shillings a week. Nonsubscribers are charged full business rates of £5 5s or more. The council's report adds that the association is not to be considered as a charity but as a cooperative movement, the public hospitals remaining available for those in necessitous circumstances, but it is open for any one to secure the admission of such cases to a bush nursing hospital by paying for them. The system is exactly what is needed in the country.

Sight Saving in Tasmania

The first Australian sight saving school was started this year in Hobart, Tasmania. It provides for the maintenance of special classes to educate pupils whose sight does not permit them to do the work of the regular grades or who attempt it only at the expense of their limited sight. Planned by the state department of education under the guidance of Mr. C. V. Brooks, director, it has the enthusiastic support of ophthalmologists. Not only will it be of inestimable benefit to the people of the island state, but some of the larger states which have resisted all the persuasive efforts of far-seeing ophthalmologists may be shamed into taking belated action. The object of the school will be to instruct the pupils with the minimum of eyestrain to teach them to conserve the vision they possess and to provide such vocational guidance and, if necessary, vocational training as will enable them to fill the most useful places in the community that their powers will permit. The small specially designed building will be an annex to one of the large state schools in Hobart. The teacher will be under the control of the head master of the larger school. The children will thus be members of a large school and at the same time will have all the facilities necessary for their tuition. Prior to the establishment of this school, children with defects in vision have been sent to schools for the blind or have been allowed to plod on in ordinary schools. In the former circumstances they no doubt received some psychologic trauma and possibly some stigmas; in the latter they were severely handicapped. Medical practitioners in all parts of Australia look forward to the time when other states will follow this excellent example.

ITALY

(From Our Regular Correspondent)

Feb. 15, 1940.

Annual Report on Public Health

Reports on the condition of public health and sanitation in Italy during 1939 were recently presented to the Department of Public Health and Sanitation. The mortality from tuberculosis for the entire population included 25,813 deaths from pulmonary tuberculosis and 9,134 deaths from extrapulmonary tuberculosis. Laws by which antituberculosis centers were established in the provinces of Italy were made in 1927. The rate of mortality dropped from 147 deaths per hundred thousand of population in 1927 to 80 in 1939, a 46 per cent reduction in the mortality rate from tuberculosis in 1939 in comparison to 1927. The Ministerial Offices of Public Health gave money and support to the provincial organization for the establishment of antituberculosis dispensaries, which number 460. Some dispensaries are evolving into polyclinics with special departments for the early diagnosis of tuberculosis. The patients in dispensaries and calls at home during the year numbered 1,284,000. Medical care was given during the year to 770,000 patients who were suffering from tuberculosis. Hospital care was given to 24,456 tuberculous patients. Care in institutions for the prevention of the disease was given to 34,552 predisposed persons. There are 430 institutions for the care of pulmonary tuberculosis patients, namely climatic sanatoriums, sanatorial hospitals, tuberculosis specialized hospitals and private tuberculosis hospitals; 41,611 beds were used by

85,468 patients with a right to the bed for at least six months to each patient. Departments for the readaptation of the patients for work are already established in some sanatoriums. Anti-tuberculosis vaccines are obligatory for infants who are living in asylums and similar centers. In children separated from their families because of tuberculous contacts, allergy is determined by means of an intradermal test made two months after the separation of the child from the infected environment. About 60,000 vaccinations have been made in children. There are several colonies of heliotherapy at the seashore and in the mountains for the sojourn of patients. Before being admitted, the patients are vaccinated against smallpox, diphtheria and typhoid.

Centers for the distribution of human milk and for the care of women during pregnancy and labor and similar centers have been established by the National Department for Welfare. The people are instructed on puericulture, and the education of midwives is intensified. The number of births in the country exceeded by 9.7 per cent that of deaths, with a total of 1,031,193 live births. Fecundity of women has diminished during the last fifteen years. Centers against sterility have been established in the cities and towns, where the natality rate is low. Diseases of the digestive tract are the most frequent cause of infant mortality. Abortion numbered 86,011 cases.

Blood Transfusion Centers

The Ministry of Internal Affairs has published through the Department of Public Health precise standards for the organization of centers for blood transfusion. Donors are already organized in various provinces. The charge for blood will differ in public and private hospitals and also for professional and occasional donors. The expense of maintaining organizations of donors will be met with funds obtained by voluntary donations and allowances from the government. Donors will be provided with record books in which their blood group will be noted. The provinces will have the proper equipment for the preservation of blood. Municipal physicians will promote direct transfusion with preserved blood and also the preservation and use of blood serum of patients who are convalescing from certain infections. In case of war, centers will be organized by the Ministries of Internal Affairs and of War, by means of which blood from civilians will be obtained and preserved for proper use. Donors will be civilians who do not meet the requirements for military service.

Marriages

IRVING E. SHAFER, Salisbury, N. C., to Miss Maggie Jane Honeycutt of Franklinton in New York, January 16.

EDWARD REYNOLDS MACLENNAN, Opp, Ala., to Miss Helen Louise O'Neal of Andalusia in February.

WILLIAM W. TRICE JR., Tampa, Fla., to Miss Rosemary Mahler of New Orleans in January.

JOHN SHORE HASH, Williamsport, Ind., to Miss Charlotte Sputh of Indianapolis, February 15.

ARTHUR D. JOHNSON, Spokane, Wash., to Miss Agnes Engbretson of Granite Falls, January 1.

JOHN L. MCCLINTOCK, Cadiz, Ohio, to Miss Myrtle Hatchell of Daytona Beach, Fla., January 17.

JOHN L. JELKS, Memphis, Tenn., to Mrs. Louise Whitmire Speegle of Denver, January 25.

WILLIAM BATTLE MALONE II to Miss Alice Allen, both of Memphis, Tenn., February 3.

LOUIS SHATTUCK BAER to Miss Evelyn Cross, both of Chicago, February 25.

FRANCIS X. MEIER, Milan, Ill., to Miss Melva Rounsaville of Moline in January.

Deaths

Joshua Marsden Van Cott ☉ Brooklyn; Long Island College Hospital, Brooklyn, 1885; assistant on the teaching staff at his alma mater, 1886-1887, curator from 1887 to 1900, lecturer from 1887 to 1889, adjunct professor from 1889 to 1891, professor of histology and pathologic anatomy from 1891 to 1899, professor of histology and bacteriology from 1899 to 1914, professor of clinical medicine from 1914 to 1917, emeritus professor of pathology and clinical medicine, consulting pathologist since 1924, and since 1938 a member of the board of trustees; president of the board of trustees of the Hoagland Laboratory; past president of the Medical Society of the County of Kings; a founder of the Associated Physicians of Long Island; fellow of the American College of Physicians; in 1913 served on the advisory committee of the board of health of New York; on the staffs of the Kings County Hospital, St. John's Hospital, Brooklyn Hospital, Wyckoff Heights Hospital, Coney Island Hospital, Methodist Episcopal Hospital, Brooklyn State Hospital and the Long Island College Hospital; aged 78; died, February 8, of cerebral hemorrhage.

Sidney D. Wilgus ☉ Rockford, Ill.; University of Buffalo School of Medicine, 1895; fellow of the American College of Physicians; member of the American Psychiatric Association and the Central Neuropsychiatric Association; past president of the Chicago Neurological Society; alienist for the department of welfare of Illinois from 1929 to 1933; chairman of the New York State Board of Alienists from 1904 to 1910; on the staff of St. Lawrence State Hospital, Ogdensburg, N. Y., 1895-1902; superintendent of the Elgin (Ill.) State Hospital, 1910-1911, and of Kankakee (Ill.) State Hospital from 1911 to 1913; on the staff of the Rockford General Hospital; founder of the Wilgus Sanitarium (Elmblawn) in 1913; on the staff of the Rockford Children's Home; veteran of the Spanish-American and World Wars; aged 68; died, February 23, of coronary occlusion.

Laurence R. Taussig ☉ San Francisco; University of California Medical School, San Francisco, 1919; associate clinical professor of dermatology at his alma mater; member of the American Dermatological Association and the American Academy of Dermatology and Syphilology; at one time vice president of the American Radium Society; on the staffs of

Luke's Hospital, University of California Hospital, Children's Hospital, Shriners' Hospital, San Francisco Hospital and Southern Pacific Hospital; aged 46; died, February 11, of coronary thrombosis.

Charles Marshall Chilton, Memphis, Tenn.; Memphis Hospital Medical College, 1901; member of the American Biological Association; served during the World War; clinical assistant in genito-urinary diseases in 1918-1919 and instructor in genito-urinary surgery in 1919 and 1920 at the University of Tennessee College of Medicine; on the staffs of the Methodist and St. Joseph's hospitals; aged 60; died, February 10, of coronary occlusion.

Joseph E. Green, Laurel, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1909; member and president of the Mississippi State Medical Association; president of the South Mississippi Medical Society; on the staffs of the Laurel General Hospital and the South Mississippi Hospital; aged 54; died, February 5, of dissecting aneurysm of the aorta.

Vilbur Howard Harris, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1888; past president of the Toronto Academy of Medicine; was chairman of the medical board of Toronto Hospital for Incurables; dean of the staff of Grace Hospital from 1918 to the time of its amalgamation with the onto Western Hospital; aged 75; died, February 6.

Laurence Reginald Hyde ☉ Brooklyn; Long Island College Hospital, Brooklyn, 1894; formerly clinical professor of gynecology and obstetrics at his alma mater; fellow of the American College of Surgeons; consulting gynecologist to the Long Island College Hospital; member of the courtesy staff of Brooklyn Hospital; aged 69; died, February 9.

William Watts Dunn, Beaumont, Texas; College of Physicians and Surgeons, Little Rock, 1911; member of the State Medical Association of Texas; past president of the Angelina County Medical Society; health officer; on the staffs of the Hotel Dieu Hospital and St. Therese Hospital; aged 57; died, February 5, of coronary thrombosis.

Joseph Gerhard Beykirch Jr. ☉ East St. Louis, Ill.; St. Louis University School of Medicine, 1914; past president of St. Clair County Medical Society; on the staffs of St. Mary's Hospital; aged 51; died, February 5, in the Good Samaritan Hospital, West Palm Beach, Fla., of myocarditis, nephrosclerosis and hypertension.

Joseph Clement Langan ☉ Clinton, Iowa; Rush Medical College, Chicago, 1891; past president of the Clinton County Medical Society; served during the World War as a member of the U. S. Army medical advisory board; past president and member of the staff of Mercy Hospital; aged 70; died, February 7, of coronary thrombosis.

Charles Cleveland Spangler, York, Pa.; College of Physicians and Surgeons, Baltimore, 1915; member of the Medical Society of the State of Pennsylvania; past president of the York County Medical Society; served during the World War; aged 53; on the staff of the York Hospital, where he died, January 17.

Charles Webster Tressler, Shickshinny, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; for many years deputy coroner of Luzerne County; aged 62; on the staff of the Nanticoke (Pa.) State Hospital, where he died, January 6, of a skull fracture received in a fall.

Harry W. Keatley, Rock Island, Ill.; Maryland Medical College, Baltimore, 1903; served during the World War; for many years connected with the United States Public Health Service; aged 59; died, February 9, in the Mercy Hospital, Davenport, Iowa, of a gunshot wound of the head.

Michele G. Caturani, New York; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1899; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; one of the founders of the Parkway Hospital; aged 66; died, February 24.

James Willard Sillaman, Bradenville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1905; member of the Medical Society of the State of Pennsylvania; served during the World War; on the staff of the Latrobe (Pa.) Hospital; aged 65; died, January 3, of carcinoma of the colon.

Frederick E. Adams, Eugene, Ore.; University of Oregon Medical School, Portland, 1911; member of the Oregon State Medical Society; served during the World War; aged 59; on the staff of the Sacred Heart Hospital, where he died, February 11, of carcinoma of the stomach.

Joseph Edmond Doussan, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1891; formerly state senator, member of the state board of health, parish board of health and school board; formerly health officer of Litcher, La.; aged 70; died, February 4.

Charles Archibald Ritchie, Wilmington, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1895; formerly member of the state board of health; aged 67; on the staff of the Homeopathic Hospital, where he died, February 2, of carcinoma of the prostate.

Robert Bruce Wells, Edmonton, Alta., Canada; University of Toronto Faculty of Medicine, Toronto, 1894; professor emeritus of ophthalmology at the University of Alberta Faculty of Medicine; fellow of the American College of Surgeons; aged 72; died, January 30.

Edward Holtz, New York; University and Bellevue Hospital Medical College, New York, 1925; member of the Medical Society of the State of New York; aged 37; was found dead, February 21, of an incised wound of the throat caused by a broken shaving mug.

Martin Luther Koser, Nebraska City, Neb.; Jefferson Medical College of Philadelphia, 1903; served during the World War; formerly secretary of the board of health; aged 63; died, January 18, in the Veterans Administration Facility, Lincoln, of tuberculosis.

Silas Johnson Brimhall, Oakland, Calif.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1902; member of the California Medical Association; at one time health officer of Elsinore; aged 66; died, January 30, of angina pectoris.

Stanford L. Warren, Durham, N. C.; Leonard Medical School, Raleigh, 1895; one of the founders, on the staff and for many years chairman of the board of trustees of the Lincoln Hospital; aged 77; died, January 31, of carcinoma of the rectum.

Jesse Clyde Graves, Lockesburg, Ark.; University of Arkansas School of Medicine, Little Rock, 1914; member of the Arkansas Medical Society; member of the school board; served during the World War; aged 59; died, February 2.

Emilie Bretthauer, Suifu, Szechwan, China; Woman's Medical College of Pennsylvania, Philadelphia, 1904; an Associate Fellow of the American Medical Association; for many years a medical missionary; aged 65; died, February 11.

James Arthur Keiger Ⓢ Greensboro, N. C.; University of Virginia Department of Medicine, Charlottesville, 1916; served during the World War; aged 56; died, February 1, in St. Leo's Hospital of acute myocarditis following a cholecystotomy.

John Selden Richardson, Holly Fork, Va.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; aged 70; died, February 6, in a hospital at Richmond of cerebral hemorrhage.

William Carter Mebane, Wilmington, N. C.; North Carolina Medical College, Davidson, 1905; member of the Medical Society of the State of North Carolina; aged 57; died, February 4, of cerebral embolism and chronic hepatitis.

William Addis Howard, Vincent, Ohio; Central College of Physicians and Surgeons, Indianapolis, 1895; member of the Ohio State Medical Association; aged 68; died, February 15, in the Marietta (Ohio) Memorial Hospital.

Burt Horace Hardinger Ⓢ Mattoon, Ill.; Rush Medical College, Chicago, 1916; served during the World War; aged 47; on the staff of the Memorial Methodist Hospital, where he died, February 4, of diabetes mellitus.

Percy Ahrons, Tampa, Fla.; Tulane University of Louisiana School of Medicine, New Orleans, 1893; for many years connected with the United States Public Health Service; aged 67; died, January 31, of coronary sclerosis.

Peter William Holleman, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; on the staff of the Roseland Community Hospital; aged 79; died, February 8, of coronary occlusion.

Julius H. Weinsburg, St. Louis; Marion-Sims College of Medicine, St. Louis, 1891; member of the Missouri State Medical Association; aged 75; died, February 1, in St. Anthony's Hospital of cerebral hemorrhage.

Lewis Junius Battle, Washington, D. C.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; member of the Medical Society of the District of Columbia; aged 74; was found dead, February 15.

Charles Wesley Race, Chicago; Western Reserve University Medical Department, Cleveland, 1897; aged 66; died, February 2, in St. Francis Hospital, Evanston, Ill., of arteriosclerosis and cerebral thrombosis.

George Jerome Edam, Put in Bay, Ohio; St. Louis University School of Medicine, 1934; aged 33; died, February 14, when the automobile in which he was driving plunged through the ice into 30 feet of water.

Edward Lincoln Sutton Ⓢ Bellevue, Pa.; University of Maryland School of Medicine, Baltimore, 1907; on the staff of the Suburban General Hospital; aged 60; died, January 25, of influenza and pneumonia.

Lee F. Duckett, Florence, Ala.; University of Tennessee Medical Department, Nashville, 1894; member of the Medical Association of the State of Alabama; aged 72; died, February 1, of coronary occlusion.

John Franklin Anderson, Hillsboro, Ga.; College of Physicians and Surgeons, Baltimore, 1885; member of the Medical Association of Georgia; aged 79; died, Dec. 3, 1939, of cerebral hemorrhage.

Marshall McClelland Thompson, Pitcairn, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1904; served during the World War; aged 60; died, January 29, of diabetes mellitus and gangrene of the foot.

Katharine Louise Eager Bowdle, East Ely, Nev.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909; on the staff of the Steptoe Valley Hospital; aged 56; died, February 16.

John Boyle Travers, St. John, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., Canada, 1897; for many years on the staff of the Provincial Hospital; aged 75; died, January 11.

Edgar Zeh, Waterford, N. Y.; Albany (N. Y.) Medical College, 1884; member of the Medical Society of the State of New York; aged 79; died, January 10, of cerebral hemorrhage and acute nephritis.

Horace Greely Hilliard, Minong, Wis.; Beaumont Hospital Medical College, St. Louis, 1891; aged 79; died, January 27, in St. Joseph's Hospital, Superior, of mitral insufficiency and arteriosclerosis.

Benjamin Walter Greene, Macon, Ga.; University of Georgia Medical Department, Augusta, 1912; member of the Medical Association of Georgia; aged 53; died, February 5, of coronary occlusion.

George Henry Van Gaasbeek, Springfield, Mass.; Albany (N. Y.) Medical College, 1893; member of the Massachusetts Medical Society; aged 76; died, January 22, of arteriosclerosis and heart disease.

William Thomas Owen Parry, Toronto, Ont., Canada; Victoria University Medical Department, Coburg, 1885; L.R.C.P., London, 1886; M.R.C.S., England, 1887; aged 80; died, February 1.

Elizabeth N. Arnstein Ⓢ New York; Columbia University College of Physicians and Surgeons, New York, 1927; on the staff of the Bellevue Hospital; aged 37; died, February 23, of acute leukemia.

Emmanuel Reuben Fast, Fostoria, Ohio; Cincinnati College of Medicine and Surgery, 1899; member of the Ohio State Medical Association; aged 71; was found dead in February of angina pectoris.

William Howard Stroup, Spencer, Ohio; University of Wooster Medical Department, Cleveland, 1885; for many years president of the town board of education; aged 88; died, February 4.

Winfred E. Conklin, Paris, Ill.; Hahnemann Medical College and Hospital, Chicago, 1902; aged 63; died, February 15, in St. Anthony's Hospital, Terre Haute, Ind., of mesenteric thrombosis.

Moody M. Harvill, Nashville, Tenn.; University of Tennessee Medical Department, Nashville, 1890; veteran of the Spanish-American War; aged 73; died, February 5, of coronary thrombosis.

Sara Geraldine Vernon, Madison, Wis.; Northwestern University Woman's Medical School, Chicago, 1897; aged 75; died, January 7, of heart disease, arteriosclerosis and bronchopneumonia.

Olav Nelson Birkland Ⓢ Hibbing, Minn.; Northwestern University Medical School, Chicago, 1917; on the staff of the Rood Hospital; aged 52; died, February 2, of coronary thrombosis.

Irvin Everett Huston, Galva, Ill.; State University of Iowa College of Medicine, Iowa City; 1888; aged 80; died, February 11, at the Galesburg (Ill.) Cottage Hospital of pneumonia.

Leo Vivian Rosenthal Ⓢ Mountain Dale, N. Y.; University and Bellevue Hospital Medical College, New York, 1909; served during the World War; aged 55; died, January 31, in Brooklyn.

Henry P. Fischer Ⓢ Shakopee, Minn.; Detroit College of Medicine, 1894; aged 69; died, January 24, in Minneapolis of subdural hemorrhage, fracture of the leg and arm and coronary sclerosis.

Verner Delaskie Ludwick, Franklin, Ind.; Miami Medical College, Cincinnati, 1889; aged 75; died, February 2, in the Indiana State Masonic Home of chronic myocarditis and nephritis.

William Lincoln Allen, Unadilla, N. Y.; Albany (N. Y.) Medical College, 1881; member of the Medical Society of the State of New York; aged 79; died, January 26, of coronary sclerosis.

William Eberle Thompson ♂ Bethel, Ohio; Cincinnati College of Medicine and Surgery, 1860; Civil War veteran; aged 104; died, February 19, of mitral insufficiency and chronic arthritis.

Nikolaos Salopoulos, Chicago; National University of Athens School of Medicine, Greece, 1890; aged 74; died, February 2, in the Presbyterian Hospital of chronic myocarditis.

Clarence Henry Hanson, Bode, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; aged 57; died, January 20, in the Mercy Hospital, Fort Dodge, of myocarditis.

Morris Morton Wechsler, New York; New York Homeopathic Medical College and Flower Hospital, New York, 1929; aged 35; was found dead, February 7, in a hotel in Brooklyn.

John Webster Weed, Detroit; Michigan College of Medicine and Surgery, Detroit, 1895; member of the Michigan State Medical Society; aged 77; died, February 6, of heart disease.

Virgil Connor Totman ♂ Waterville, Maine; Medical School of Maine, Portland, 1900; on the staff of the Sisters Hospital; aged 67; died, January 6, of coronary thrombosis.

William Eaton Sims, Washington, D. C.; Columbian University Medical Department, Washington, 1899; aged 72; died, January 31, of advanced bronchiectasis and arteriosclerosis.

George Ball ♂ Brooklyn; Long Island College Hospital, Brooklyn, 1912; on the staff of the Unity Hospital; aged 53; died, February 16, at the Mount Sinai Hospital, New York.

Willis Webster Gleason, Fort Pierce, Fla.; Boston University School of Medicine, 1877; formerly a minister; aged 86; died, January 26, in the Fort Pierce Memorial Hospital.

Oscar Weiss, Santa Monica, Calif.; Rush Medical College, Chicago, 1936; aged 29; died, January 3, in the Santa Monica Hospital of injuries received in an automobile accident.

Christian Herm Eyermann, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1887; aged 83; died, February 18, of diabetes mellitus and arteriosclerosis.

Howard Addison Sharpe ♂ Verona, Wis.; Northwestern University Medical School, Chicago, 1907; aged 56; died, January 20, of hypertension and chronic myocarditis.

William Lincoln Bond, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1890; aged 74; died, February 7, in the Morrell Memorial Hospital, Lakeland, Fla.

Christian Reese Gaul, Sinking Spring, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1884; aged 81; died, Dec. 23, 1939, of chronic myocarditis.

Almond B. Blaydes, Atoka, Tenn.; Kentucky School of Medicine, Louisville, 1897; aged 65; died, February 14, in the Methodist Hospital, Memphis, of hypertension.

Edward Everett Meade, Denver; St. Louis College of Physicians and Surgeons, 1922; member of the Colorado State Medical Society; aged 48; died, February 7.

William Francis George, San Benito, Texas; St. Louis Medical College, 1889; University Medical College of Kansas City, Mo., 1904; aged 74; died in February.

David L. Bley, Staunton, Ill.; Jefferson Medical College of Philadelphia, 1875; member of the Illinois State Medical Society; aged 86; died, February 16.

Peter Nicholas Gatsos, Cleveland; University of Maryland School of Medicine, Baltimore, 1916; aged 57; died, February 7, of coronary thrombosis.

Leone Morden Scruby ♂ Des Moines, Iowa; University of Illinois College of Medicine, Chicago, 1905; aged 63; died, January 25, of cerebral hemorrhage.

Frank Augustus Detrick, Tallahassee, Fla.; Medical-Chirurgical College of Philadelphia, 1903; aged 65; died, February 2, of coronary thrombosis.

Hugh L. Hall, Amherst, Ohio; Western Reserve University Medical Department, Cleveland, 1884; aged 79; died, February 16, of arteriosclerosis.

Fountain Burr Ridgeway, Buckhannon, W. Va.; College of Physicians and Surgeons, Baltimore, 1891; aged 73; died in January of diabetes mellitus.

Charles Fremont Flanders ♂ Manchester, N. H.; Dartmouth Medical School, Hanover, 1881; aged 82; died, February 4, of hemiplegia.

G. Manley Ransom, New York; Long Island College Hospital, Brooklyn, 1875; aged 89; died, February 4, in Warren, R. I., of arteriosclerosis.

James Luther Koontz, Rutledge, Tenn.; Tennessee Medical College, Knoxville, 1902; aged 57; died, January 28, of combined posterolateral sclerosis.

Elwin Pasco Whitford, Belmont, Mass.; Eclectic Medical Institute, Cincinnati, 1878; aged 87; died, January 15, of coronary thrombosis.

John Frank Standeven ♂ Oakland, Iowa; John A. Creighton Medical College, Omaha, 1911; aged 54; died, January 15, of coronary thrombosis.

James Alexander Houston, Oak Park, Ill.; Jenner Medical College, Chicago, 1904; aged 64; died, February 26, of coronary thrombosis.

Fannie H. Howe, Atchison, Kan.; Ensworth Medical College, St. Joseph, Mo., 1891; aged 74; died, January 23, of bronchopneumonia.

George Walter Eastham, Fort Worth, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1897; aged 65; died, February 12.

Shelah D. Davis, Cookeville, Tenn.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 62; died suddenly, February 7.

John W. Burkett, Fort Worth, Texas; Kentucky School of Medicine, Louisville, 1887; aged 79; died, January 28, of diabetes mellitus.

John Akester, Hardinsburg, Ind.; Medical College of Indiana, Indianapolis, 1893; aged 73; died, February 14, of carcinoma of the prostate.

Julian Southworth Boyd, Simcoe, Ont., Canada; University of Toronto Faculty of Medicine, 1909; aged 51; died, February 12.

John Green Hossack, Innerkip, Ont., Canada; University of Toronto Faculty of Medicine, 1898; aged 68; died, February 25.

Theodore Lightner, Hastings, Neb.; College of Physicians and Surgeons, Baltimore, 1880; aged 83; died, January 18, of myocarditis.

John Allenson Nelms, Atlanta, Ga.; Southern Medical College, Atlanta, 1883; aged 76; died, February 1, of carcinoma of the neck.

Albert L. Trabue, Springfield, Ill.; Pulte Medical College, Cincinnati, 1881; aged 80; died, February 5, in St. John's Hospital.

Herman Drexler, Brooklyn; Baltimore University School of Medicine, 1900; aged 63; died, February 6, in Miami Beach, Fla.

Harvey Elgin Hicks, Griswold, Man., Canada; Manitoba Medical College, Winnipeg, 1897; aged 75; died, February 21.

Percival Hearn, Clinton, Ont., Canada; University of Toronto Faculty of Medicine, 1915; aged 47; died, February 12.

Thomas J. Crawford, Atlanta, Ga.; Atlanta Medical College, 1886; aged 81; died, February 12, of organic heart disease.

William H. Gibbons ♂ Croom, Md.; Baltimore Medical College, 1884; aged 77; died, February 19, of myocarditis.

William Atwood, Walla Walla, Wash.; Chicago College of Medicine and Surgery, 1917; aged 69; died, February 12.

Thomas Joseph Ney, Chicago; Chicago Medical School, 1921; aged 45; died, February 5.

Correspondence

CHEMICAL TESTS FOR ALCOHOLIC INTOXICATION

To the Editor:—The observations of Swim, McCawley and Leake (Chemical Tests for Alcoholic Intoxication, correspondence, *THE JOURNAL*, March 23, p. 1098) in normal healthy rabbits that have never ingested alcohol are surprising and if later confirmed will definitely prove that the test for drunkenness should not be applied to rabbits. However, I have performed numerous tests on human beings living and dead and have never found alcohol that had not been taken into the body.

The chemical test for alcohol in body fluids (Heise, H. A.: The Specificity of the Test for Alcohol in Body Fluids, *Am. J. Clin. Path.* 4:182 [March] 1934) has been shown to be accurate for all practical purposes in tests applied to human beings. The best evidence of the specificity of the test is that the percentage of alcohol found by chemical means agrees closely with the refractometer readings calculated as for alcohol. In fact, this agreement has been so remarkably accurate that I believe the refractometer can be dispensed with. Carefully conducted experiments have revealed that lactic acid does not appear in the distillate even when sour milk is distilled by the same method that is used when body fluids are tested for alcohol. Rapid distillation involves decomposition of lactic acid, but I see no occasion for excessive heating. The following experiment clearly explains the fallacious results due to rapid distillation.

Time of Distillation	pH	Reduction of Potassium Dichromate Interpreted as per Cent of Alcohol	Color of Distillate
2½ minutes.....	4.9	0.033	slightly yellow
10 minutes.....	5.4	0.008	colorless
30 minutes.....	5.4	0.008	colorless

Ten cc. of 10 per cent lactic acid mixed with the picric-tartaric solution were distilled at various rates, 10 cc. of distillate being collected in each case. It is obvious that rapid distillation forces reducing acid products into the distillate. If colorless distillates are used, indicating the absence of picric acid, there will be no important lactic acid decomposition products in the filtrate. Acetone and ether have no appreciable effect, since in this test the reduction of potassium dichromate has a time limit sufficient to give a final reading for alcohol but not for the slower oxidizable acetone or ether. Even a 1 per cent solution of acetone failed to give an appreciable reading as for alcohol, and the blood of a person under an ether anesthetic failed to show a reducing substance in the test for alcohol. It is possible that titration methods may give false readings owing to reducing substances which are completely oxidized by potassium dichromate, but the method that I use does not involve titration. The only substance that has been found to interfere has been formaldehyde, and this substance can readily be detected and removed.

The following figures are for the so-called normal alcohol in the body, quoted from C. C. Weeks (Alcohol and Human Life, London, H. K. Lewis & Co., Ltd., 1939, p. 30): Schweisheimer and the average of thirteen other observers: from 0.0029 to 0.0031 per cent; Ford, 0.00057 per cent; Harger and Goss (The So-Called Normal Alcohol of the Body, *Am. J. Physiol.* 112:374 [June] 1935) on the other hand, found that the actual alcohol amounted to but 0.000027 per cent, since they were able to eliminate the substances produced by destructive distillation. Even the highest figure of these confirmed investigations is so low that it has no practical bearing on the

medicolegal value of the tests. Weeks very aptly states that this amount "can have no bearing on the question of inebriety, and since it is found in the blood of abstainers it is merely a 'red herring' to quote such a theoretical presence of alcohol."

It is clear that all these observers have obtained results which are decidedly lower than the figures obtained by Leake and his associates.

HERMAN A. HEISE, M.D., Milwaukee.

Chairman, Committee to Study Problems
of Motor Vehicle Accidents of the
American Medical Association.

"ASPIRATION PNEUMONITIS, AN OBSTETRIC HAZARD"

To the Editor:—A recent contribution "Aspiration Pneumonitis, An Obstetric Hazard" by Dr. Charles C. Hall of Oakland, Calif., deserves further comment. Dr. Hall presents reports of fourteen women in labor who vomited while affected by pain relieving drugs; five of them died as a result, and the infant of one of them also was lost. The paper emphasizes the danger of the occurrence of vomiting by anesthetized patients but does not go far enough. Similar occurrences are not infrequent in patients depressed from the action of drugs other than anesthetics and from illness or accident, as well as during induction and recovery from surgical anesthesia. When pneumonitis or death from asphyxia results from inhaled vomitus, it is doubtful whether the physician in attendance should be held blameless.

Effects following injury, illness and administration of drugs for relief of pain exaggerate the hazard of aspiration of foreign matter into the respiratory tract. In addition to induction of sleep, relief of pain or anesthesia, drugs have four types of pharmacologic effects which are pertinent to the discussion.

1. *Disturbance of the Autonomic Nervous System.*—Either hypo-active or hyperactive reflex mechanisms may result. Important to the function of respiration are the reflexes of the pharynx, the larynx, the vomiting reflex, the cough reflex and ciliary activity. Although profound drug action may completely abolish all these functions, moderate dosage may hyperactivate some of them. Moderate dosage is aimed at in the relief of pain in labor and often in anesthesia for children. It is in just these two classes of patients that the stomach is likely to contain food previous to drug administration. Failure to recognize the aspiration of vomitus and failure to attribute the following "bronchopneumonia" to its true cause has been all too frequent. An anesthetist, however, can scarcely agree with Dr. Hall in absolving the administrator of drugs from responsible supervision of the physiologic welfare of his patient while the action of the drug lasts.

2. *Disturbance of Psychic Activity.*—An irrational patient or a sleepy one may fail to change his position, expectorate or otherwise protect the glottis from contamination.

3. *Loss of Muscle Tonus.*—Weak or flaccid muscles of the tongue and pharynx frequently permit normal structures about the larynx to obstruct the glottis. If foreign substances are in the neighborhood, such relaxed muscles may fail in their function of expelling vomitus from this region.

4. *Respiratory Depression.*—Decrease in respiratory exchange is a characteristic of profound dosage of nearly all pain relieving drugs. This, together with possible obstruction and contamination of the respiratory tract, tends toward a reduction in oxygen tension of the blood, which in itself is a depressant of the respiratory centers and an embarrassment to normal cell metabolism including the cells of the pulmonary alveoli. If, in addition, the anesthetist permits inhalation of oxygen deficient atmospheres, fuel is added to the flame.

From the foregoing it is obvious that safety lies in preventing obstruction and contamination of the air passages, as far as this is possible, by careful individualization of dosage. Precise dosage of drugs may be impossible. Constant supervision of the respiration of drugged patients is not impossible. By prompt and judicious application of technical remedies the instant the need for them arises, the physician ought to prevent aspiration pneumonitis. Gravity drainage of the pharynx, through the use of the lateral, prone or extreme Trendelenburg position, is often of value. Promptness is essential whatever the treatment adopted. Mechanical removal of foreign material from the pharynx with the finger and a sponge or with aspiration is often life saving. Restoration of the cough reflex by immediately decreasing the concentration of inhalation agents is sometimes effective.

If efforts at preventing tracheal and bronchial contamination fail, I believe that pneumonitis can usually be prevented by prompt and thorough toilet of the tracheobronchial tree. Such a cleansing of the main air passages (while the position of the patient is changed in all possible planes of space and while coughing is encouraged) can be performed by a bronchoscopist. Since he is seldom available instantly, it has become the practice of many anesthetists to clear the contaminated respiratory tract by means of a small semisoft or soft rubber aspirating tube passed through one of the large endotracheal airways commonly used by anesthetists to insure an unobstructed airway in anesthetized patients. Not infrequently those so treated, whose respiratory tracts have been completely contaminated, not only with vomitus but also with pus or blood, have escaped subsequent pneumonitis.

RALPH M. WATERS, M.D., Madison, Wis.

To the Editor:—I wish to commend Dr. Charles C. Hall for his article on "Aspiration Pneumonitis," which appeared in THE JOURNAL March 2. He has called attention to a very important complication which occurs all too frequently. In my experience as an anesthetist, by far the greatest number of complications from aspiration have occurred in obstetric patients. Frequently these patients have gone into labor after a full meal, but many times they have been given food while in active labor in the hospital. It cannot be urged too strongly that all women in labor be denied food and so-called sustaining drinks. I don't believe that any woman will die of starvation if deprived of food for from twelve to eighteen hours. If nourishment is imperative, dextrose may be given intravenously.

The practice of many obstetricians in demanding very light or "in and out" anesthesia is conducive to vomiting. To abolish the swallowing and vomiting reflex entirely, the depth of anesthesia must be to the first plane of surgical anesthesia.

Aspiration pneumonitis occurs infrequently with the surgical patient in my experience. The only cases that I can recall occurred in surgical emergencies in which the stomach was full. I can easily recall at least a dozen complications of this nature with obstetric patients, ranging from mild to extremely severe, fortunately with no fatalities.

The point made by the author concerning the importance of having adequate suction apparatus in readiness cannot be over-emphasized. The prompt use of suction may mean the life or death of the patient.

I feel that the incidence of this complication is much greater in obstetric patients than in any other type of work requiring anesthesia. With the use of a continuous anesthesia rather than the so-called intermittent technic, one is much less apt to have vomiting. When explosive anesthetic agents are used there is also a great deal more danger of the possibility of explosion, because of the production of static with repeated application and removal of the mask in the intermittent administration.

Regarding prevention, I feel that the most important factor is to withhold food entirely from all patients in active labor and to withhold water as soon as it is apparent that delivery will follow within a few hours.

J. D. SPAID, M.D., Dayton, Ohio.

GENTIAN VIOLET FOR PINWORM INFESTATION

To the Editor:—With regard to the article in THE JOURNAL, March 9, on "Studies on Oxyuriasis: Efficiency of Gentian Violet in the Treatment of Pinworm Infestation" by Drs. Willard H. Wright and Frederick J. Brady, I should like to call attention to the use of "infusion of quassia" injected into the rectum. In a practice of more than fifty years, largely in a farming community, I never saw a failure with this treatment. To prevent reinfestation, cleanliness is of vital importance, particularly of the infected person's hands as well as of his clothing and bed clothing. Stools should be disinfected. Sleeping with an infected person should be forbidden. Raw fruits and vegetables should be thoroughly washed and cleansed, especially when used raw in salads.

J. NEWTON HUNSBERGER, M.D., Norristown, Pa.

NIRVANOL AND DILANTIN SODIUM

To the Editor:—The literature that is rapidly accumulating with regard to the use of dilantin sodium fails to note its similarity to nirvanol, which was formerly used widely in the treatment of Sydenham's chorea.

Nirvanol is phenylethylhydantoin and dilantin sodium is sodium diphenyl hydantoinate, obviously a closely related chemical compound. The toxic manifestations of nirvanol so closely resemble those of dilantin sodium that it could hardly be a coincidence. The greater incidence of toxic manifestations in using the former can be attributed largely to the fact that its efficacy was thought to depend on the production of fever and a scarlatiniform or morbilliform rash. In addition, Pilcher and Gerstenberger (*Am. J. Dis. Child.* 40:1239 [Dec.] 1930) recorded the complications of irritation of the mucous membranes and stomatitis from phenylethylhydantoin which is probably comparable to the gingivitis occurring after sodium diphenyl hydantoinate as reported by Kimball (*THE JOURNAL*, April 1, 1939, p. 1244). Tisdall (*Arch. Dis. Childhood* 5:397 [Dec.] 1930) and Marick (*Arch. Pediat.* 48:525 [Aug.] 1931) have described the successful treatment of convulsions with phenylethylhydantoin. Eosinophilia is a common finding in intoxication from either drug.

There are probably additional similarities with which I am unfamiliar. It does seem, however, that the wealth of literature dealing with nirvanol might prove useful in interpreting the toxic manifestations of dilantin sodium.

F. KEITH BRADFORD, M.D., Houston, Texas.

BIOGRAPHY OF DR. WILLIAM H. PARK

To the Editor:—I am at work on a biography of Dr. William Hallock Park, the late director of the New York City Board of Health Laboratories. Any assistance rendered in the form of the loan of letters, anecdotes or other memorabilia will be gratefully received and due acknowledgment given. Reasonably prompt return of letters and other material is insured.

WADE W. OLIVER, M.D.
The William Hallock Park Laboratory,
Room 802, Bureau of Laboratories,
Foot of East 16th Street, New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

INCOMPATIBILITIES OF SULFANILAMIDE AND SULFAPYRIDINE

To the Editor:—I have been using sulfanilamide in the treatment of streptococcal infections for some time. Having been informed that the saline cathartics containing compounds of sulfur such as sodium sulfate and magnesium sulfate were incompatible with sulfanilamide, I have avoided their use in such cases. I have felt all along that it was the sulfur-containing drugs that were to be avoided but that milk of magnesia and sodium phosphate preparations were all right to use as cathartics. Recently, however, a fellow member of our profession who practices here also stated that he was of the opinion that these last named saline cathartics were also incompatible with sulfanilamide. Please advise me which of us is correct. I was under the impression that the sulfates, if used, might cause the formation of sulfhemoglobinemia, which was a dangerous condition for the patient. However, I have no information as to the incompatibility of magnesium, sodium or phosphorus in the compounds aforementioned with sulfanilamide. There has been so much admixture of superstition with science regarding the dangers in the use of sulfanilamide that I should like to have some of this cleared up. I should like to know also if the incompatibilities of sulfapyridine are the same as those of sulfanilamide.

McIntosh M. Burns, M.D., Pelham, Ga.

ANSWER.—It has been stated that the use of sodium sulfate and magnesium sulfate as cathartics in the course of sulfanilamide therapy has resulted in the formation of sulfhemoglobin in the blood of certain patients. That this is a definite possibility is probably true, but its occurrence has apparently been rare. Methemoglobin on the contrary has been commonly found in the blood of patients who are receiving sulfanilamide alone. While it seems best not to use sulfur-containing saline cathartics, there is no evidence that other sulfur-containing drugs, such as quinine sulfate, morphine sulfate and codeine sulfate, are contraindicated in the course of treatment with sulfanilamide or its derivatives and there is also absolutely no reason to believe that sulfur-containing foods should be interdicted in the course of sulfanilamide therapy.

If one is faced with the need of using laxatives or cathartics in the course of sulfanilamide therapy, one can safely use magnesium magma, sodium phosphate, cascara or liquid petrolatum. As far as is known, the incompatibilities of sulfapyridine are those of sulfanilamide.

As the questioner has pointed out, there is much "admixture of superstition with science regarding the dangers in the use of sulfanilamide." While it is unfortunate that these superstitions have arisen, they can be easily cleared up if reference is made to the reports of the Council on Pharmacy and Chemistry regarding sulfanilamide (*THE JOURNAL*, January 27, p. 326) and sulfapyridine (p. 327). These descriptions of sulfanilamide and sulfapyridine will also appear in the New and Nonofficial Remedies for 1940.

FREEZING IN GROTESQUE POSITIONS

To the Editor:—I have just seen photographs, so called, of "frozen Russian soldiers" in the newspapers. Is it possible medically (if I may use the term) for any one to be frozen stiff holding his head in his hand or in a standing position in the act of throwing a grenade or lying with a leg straight up in the air? Is it possible, for instance, for a whole battalion of soldiers to be frozen stiff in the position of loading machine guns as has been claimed? I feel certain that this is contrary to all physiologic and medical facts. Kindly let me know if I am right.

J. L. Grund, M.D., Boston.

ANSWER.—If death is due solely to exposure to cold, it is difficult to conceive how a person could suddenly "be frozen stiff" in a "standing position in the act of throwing a grenade or lying with a leg straight up in the air." It is even more difficult to conceive how it would be possible for "a whole battalion of soldiers to be frozen stiff in the position of loading machine guns." It is stated that cold hastens the onset of rigor mortis, the stiffness which develops in the musculature of the body after death (Gonzales, T. A.; Vance, Morgan, and Helpert, Milton: *Legal Medicine and Toxicology*, New York, D. Appleton-Century Company, 1937, chapter 5, p. 53). Also exposure of a dead body to a sufficiently low temperature will cause the body to be frozen stiff. However, it is unlikely that exposure to cold could be so sudden and the cold so severe as to eliminate the drowsiness, sleep and coma that precede

death from freezing. Because of that fact, persons freezing to death would naturally seek sitting, curled-up or recumbent postures (Smith A. J., and Lucke, B. H., in *Legal Medicine and Toxicology* by Many Specialists, ed. 2, edited by Frederick Peterson, W. S. Haines and R. W. Webster, Philadelphia, W. B. Saunders Company, 1923, vol. 1, pp. 243-244) and so their dead bodies when found would probably be in one of those positions. So far as is known, no accurate observations, if such have ever been made, have been reported relative to the sudden freezing of a living person.

Great muscular effort or exhaustion previous to death, sudden death, death due to violent disturbance of the nervous system, drowning and other forms of asphyxial death, and exposure to cold are factors predisposing to instantaneous cadaveric spasm or cadaveric rigidity (Taylor's *Principles and Practice of Medical Jurisprudence*, ed. 9, edited by Sydney Smith, with revision of legal aspect by W. G. H. Cook, London, J. & A. Churchill, Ltd., 1934, vol. 1, pp. 226-227), a phenomenon characterized by instantaneous stiffening of the body in the position in which it was at the moment of death without any period of muscular flaccidity which ordinarily precedes rigor mortis. For instance, an exhausted soldier on receiving a mortal wound may develop a cadaveric spasm. Under these circumstances the body may be found in a grotesque position, such as kneeling or standing upright. Usually, however, there is something which supports the body in this position. Contraction of the muscles, the result of cadaveric rigidity, may lift an extremity a short distance from the ground but not to the extent described. A man who died of a stab wound has been found in an upright position in the corner of a room, but he was supported by his elbow, which rested on a low shelf. In another instance a man has been found sitting on the edge of the bed with his elbows on his knees and his chin resting on both hands. In this case rigor was complete and the body remained in this position when it was lifted from the bed.

PEPTIC ULCER AND POSSIBLE NUTRITIONAL DEFICIENCY

To the Editor:—A married woman aged 23 has had a variety of symptoms for the past two years. The past history reveals mild childhood diseases, scarlet fever and fall hay fever since the age of 10, with chronic sinusitis. At the age of 16, weighing 138 pounds (63 Kg.), she went on a rigid diet, losing 28 pounds (13 Kg.) within two months. Dieting continued for four years. During this time menses were absent for as long as eight months. Pregnancy did not occur until a year after marriage, and a 2 pound (900 Gm.) fetus, undeveloped, was born at term. Significant in the family history is an endocrine obesity in an older sister, who rarely has a menstrual period. Present symptoms began two years ago with an epigastric pain not related to food intake. In October 1938, after delivery, soreness of the spine and muscles developed. The appetite is variable and nausea occurs frequently. Sleeplessness occurs because of epigastric pain. The patient is easily fatigued. I first examined her in September, when her complaint was loss of menses during July and August. Pelvic examination showed normal status; the breast showed marked mastitis (chronic); red blood cells numbered 4,200,000 and white cells 8,200, with the hemoglobin content (Sahli) 88 per cent. Blood Wassermann and typhoid group tests yielded negative results and previous x-ray study showed that the spine and lungs were normal. The basal metabolic rate is normal. Gastric analysis showed 37 free and 64 total hydrochloric acid, but fluoroscopic examination of the stomach showed repeatedly a small ulcer near the pylorus and delayed emptying time. Previous treatment has consisted of injections of estrogenic substances and liquid tonics. Ulcer therapy now gives only slight relief. The diagnosis has been a nutritional deficiency. What would you suggest in the way of treatment?

C. R. Chadbourne, M.D., Janesville, Minn.

ANSWER.—Analyzing this case from the data presented, one finds little to justify a diagnosis apart from peptic ulcer, with a possible nutritional deficiency. A weight of 138 pounds at age 16 is not uncommon, nor is it particularly abnormal unless the patient is short in stature. Irregular and atypical menstruation between the ages of 16 and 20 is rather frequently encountered. Fall hay fever with chronic sinusitis suggests the possibility of an allergic rhinitis. Delivery of a 2 pound undeveloped fetus at term could easily have been a missed abortion, the time of delivery being fortuitous. It is highly probable that an endocrine factor exists in this case, but whether it is sufficiently important to be serious seems debatable.

A diet that produces a weight loss of 28 pounds in two months would seem to be capable of producing a nutritional deficiency. The recent amenorrhea carries the same suggestion, but this suspicion is not borne out by the blood count. The existence of a peptic ulcer cannot be questioned.

It would seem logical to concentrate on controlling the ulcer. More vigorous management may be required. It may be necessary to keep the patient in bed and use mild sedation. The use of gastric mucin has been suggested in stubborn cases. The diet should be planned toward the healing of the ulcer even at

the expense of a gain in weight. The diet should be properly balanced, contain adequate mineral and be supplemented by vitamin therapy if necessary. Such a regimen might well clear up most of the symptoms.

ENLARGED HEART IN INFANCY

To the Editor:—An 8 months old girl, apparently in the best of health and clinically, according to the examination of a consulting pediatrician, without pathologic changes, repeatedly presented and still presents on x-ray study of the chest an enormous enlargement of the heart. The past history of the patient is important: She weighed 7 pounds (3,175 Gm.) at birth and was delivered by forceps; there were no birth injuries. From the tenth day she was fed by bottle. During the first and second week of life she had severe impetigo neonatorum with normal urine but considerable loss of weight, from the fourth to the fourteenth week of life there were moderately severe pylorospasms, which could be taken care of by atropine and a thick formula; vomiting ceased soon, and the baby was gaining weight nicely. From the sixth to the sixteenth week of life there were attacks of stertorous breathing (the mother called them "choking spells") and cyanosis, which were interpreted by the consulting pediatrician as thymus symptoms and successfully (i.e., no recurrences until now) treated with roentgen rays to the thymus region. Since the baby's fourth month of life there have been no more pathologic symptoms and observations; cyanosis, vomiting and "choking spells" have been absent. The baby is still taking the thick formula and is now receiving pabulum, egg yolk, scraped apple, banana, ample amounts of orange juice and oleum percomorphum, calcium lactate and occasionally, if necessary, drops of elixir of phenobarbital. The baby is gaining weight regularly, she now weighs 17½ pounds (8 Kg.), her length is 28 inches (71 cm.) and she has five teeth. The heart, which was found to be enlarged with the first roentgen treatment, is still large, though somewhat smaller in relation to the thorax than in the first months. The left border of the heart silhouette is only about one rib's width away from the chest wall, and the right border of the silhouette extends as far as the middle of the chest cavity. All the pictures were taken while the baby was quiet and not crying. The heart tones are normal, the rate about 125 at rest and the rhythm now still "embryonal" and watchlike. There is no cyanosis—even on exertion, as sitting up or crying—except possibly a trace when the child is cold, as after a bath. The calcification of the bones in the x-ray view is normal. The antepartum history is important, as the mother had severe pyelitis during the seventh and eighth months of pregnancy with threatened premature birth, as shown by actual labor pains during and after two ureteral catheterizations. The Wassermann reaction was negative. There was definite evidence that the mother had too little vitamin B before the birth of the child. Could this last fact be responsible for the enlargement of the heart? What are the significance, prognosis and management of this condition? Should one spare the baby any hard crying, inevitably spoiling her therewith? And should the baby later on prophylactically live the life of a heart cripple?

M.D., Texas.

ANSWER:—From the observations as noted, there is marked enlargement of the heart without murmurs of evidence of decompensation, except a rapid beat. It is assumed that the abnormal x-ray shadow is the heart and not an overly large thymus or other mediastinal tumor. The following etiologic factors must be considered in this apparent hypertrophy and dilatation of the heart without murmurs in infancy:

1. So-called idiopathic congenital hypertrophy of the heart is an increase in weight of the heart associated with simple hypertrophy of the heart muscle fibers, occurring in infancy, characterized by great cardiac enlargement in the absence of any sign of myocardial inflammatory disease.

2. Congenital hypertrophy of the heart without murmurs also occurs in certain congenital defects, as an accessory ventricle or anomalies such as the anomalous origin of the coronary artery from the pulmonary artery. The electrocardiogram often yields definite diagnostic evidence in these types of case.

3. Congenital rhabdomyoma of the heart will cause marked enlargement in infancy. Occasionally "café au lait" spots on the skin are associated with these tumors of internal organs.

4. Lesions of the kidneys such as congenital cystic kidneys or nephritis will at times cause hypertrophy and dilatation of the heart in infancy, especially when associated with hypertension. High blood pressure, low specific gravity of the urine and abnormal blood chemistry, among other signs, would conclude this diagnosis.

5. Severe anemias of long standing might be a cause, but presumably this infant has no such condition.

6. A history of acute infections or toxemias which might cause a parenchymatous myocarditis were apparently not present in the infant, at least after birth, but the severe pyelitis in the mother during the seventh and eighth months of pregnancy might conceivably have initiated an intra-uterine chronic inflammatory myocarditis in the infant. Such pathologic features have been repeatedly reported in the hypertrophied heart of infancy.

7. Avitaminosis, especially lack of thiamin resulting in such a condition as beriberi, has definitely resulted in enlargement of the heart in infancy. Even congenital beriberi has been reported. However, in all the reported cases the infant showed definite malnutrition and other signs of thiamin deficiency and rapidly

recovered completely when an adequate dietary regimen was reestablished. This infant has always been normal nutritionally and has had a well balanced diet. Electrocardiograms are said to be fairly diagnostic of beriberi hearts.

8. There is a cardiomegalic type of von Gierke's disease (glycogen storage disease). These infants often have hypoglycemia, a fasting ketonuria, an abnormal sugar tolerance curve and frequently an enlarged liver as well as an enormous heart (excessive glycogen deposits in the myocardium). These infants are normal at birth but often have retardation of development, feeding difficulties and lowered resistance to infections. Cyanosis and evidence of cardiac failure may develop early.

Further study of the electrocardiogram, blood pressure, urine and blood chemistry and other data as outlined may aid in revealing the etiology in this particular case.

Naturally the prognosis depends somewhat on the cause, if this can be determined. Generally speaking the outlook is unfavorable; the great majority of reported cases of marked cardiac hypertrophy without murmurs in infancy have progressed to a fatal termination before the eighteenth month. The heart may remain rapid with sounds of poor quality for some time, and alarming symptoms may develop with great suddenness, especially dyspnea and cyanosis with decompensation and death. Death is at times sudden and dramatic, with sudden dyspnea and cyanosis. Consequently it probably would be wise to spare the infant any hard crying, even though this leads to inevitable "spoiling." As long as the heart remains so tremendously enlarged in proportion to the chest, the child should be protected from sudden strenuous or prolonged exertion as much as possible. How many of these patients recover is unknown.

QUINOLINES FOR TRICHOMONAS INFECTION

To the Editor:—I have read recently of iodochloroxyquinoline being effective in Trichomonas infection. Would oxyquinoline be as safe and as effective used in a powder for vaginal insufflation as the halogenated derivative? If not, where can the halogenated product be purchased?

M.D., Oregon.

ANSWER:—Iodochloroxyquinoline is accepted for inclusion in New and Nonofficial Remedies under the name "Vioform" and is marketed by Ciba Pharmaceutical Products, Inc., Summit, N. J. It is used against Trichomonas vaginitis and amebiasis. In 1933 David, Johnstone, Reed and Leake (*THE JOURNAL*, May 27, 1933, p. 1658) reported that iodochloroxyquinoline was the most promising of eleven halogenated oxyquinoline compounds with the possible exception of diiodohydroxyquinoline for intestinal amebiasis. They noted "an increase in toxicity with increasing halogenation of oxyquinoline and in proportion to the atomic weight of the halogen." Huffman (*Ann. J. Surg.* 30:312 [Nov.] 1935) and Zener (*Northwest Med.* 36:7 [Jan.] 1937) attest the therapeutic efficacy of iodochloroxyquinoline in vaginal trichomoniasis. Iodohydroxyquinoline (chiniofon N. N. R.) has also been proposed for treatment of vaginal trichomoniasis (Janeway, M. M.: *New York State J. Med.* 35:528 [May 15] 1935). No recent reports have been found which refer to oxyquinoline or oxyquinoline sulfate for such therapeutic action. However, this compound has been known for a longer period than many if not most of the halogenated derivatives. From the various reports it would seem to be less toxic than the halogenated derivatives but like many preparations it may not have been given a fair trial in vaginal trichomoniasis. In the *American Journal of Obstetrics and Gynecology* (35:1085 [June] 1938) Hesseltine quoted various workers with respect to the different methods of treatment in common use for vaginal trichomoniasis. His clinical reports (*THE JOURNAL*, Sept. 4, 1937, p. 768) with silver picrate, arsenical compounds and carbohydrate therapies indicate that the physiologic restoration of the vagina to its normal state is an important factor in the treatment of vaginal trichomoniasis.

RETRAINING IN LEFT-HANDEDNESS

To the Editor:—A girl as a child was left handed and was taught to use her right hand for writing, which she is doing now at the age of 17. She gets along well in school but is a rather slow reader. I am wondering if she should return to the use of her left hand when she writes and if this would speed up her reading ability. This question is prompted by a short article which appeared in the *Archives of Ophthalmology* for July 1938 under the heading of correspondence on page 105. If you will give me your latest information on this subject, I shall appreciate it.

Lloyd H. Clark, M.D., Rochester, N. Y.

ANSWER:—At times retraining to left-handedness is indicated. In any individual case, however, whether there should be retraining or not will depend on a number of factors, such as the degree of dominance of left laterality (handedness, eyedness, footedness).

Also the degree to which there is disturbance in the reading would help determine the desirability of changing the long established habits existing in a 17 year old girl.

In addition to the specific situation with respect to laterality, the particular deficiencies in reading habits would require definition. The investigation of the patient's reading difficulties by one experienced in remedial reading technics is suggested.

SIXTH LUMBAR VERTEBRA—SPONDYLOLISTHESIS

To the Editor:—What statistics are available concerning the frequency of occurrence of a sixth lumbar vertebra? I have always been of the opinion that a sixth lumbar vertebra was quite rare. Would it be possible for a physician who examines backs for an insurance company to see such a vertebra as often as once a week or several times a month? Is it possible to associate with reading a sixth lumbar vertebra by counting the twelfth dorsal as the first lumbar merely because the twelfth dorsal has no rib attachments? Is it frequent or rare to get cases of only eleven ribs? I have a case in which the x-rays show a typical lesion of the fifth lumbar vertebra sliding forward on the sacrum (spondylolisthesis). The patient has the textbook symptoms of or for spondylolisthesis: waddly gait, list to the left side, 2 cm. shortening of the left trunk (the left ilium is 2 cm. lower than the right ilium). He has severe lumbar pain and weakness. He has an accentuation of the lumbar curve, or lordosis. There are rotation and lateral upright curvature of the lumbar spine with convexity to the left. The x-ray man does not agree with these observations. He has "sprung" the idea of a sixth lumbar vertebra. The five lumbar vertebrae are typical. There is no question in this case of there being six lumbar vertebrae.

M.D., New Jersey.

ANSWER:—There are no available statistics on the incidence of a sixth lumbar vertebra. It is a rare anomaly. It would certainly be impossible for a physician who examines backs for any insurance company to see such an anomaly as often as once a week or several times a month. He probably would not see it several times in his lifetime. The deduction that a sixth lumbar vertebra is present, based on counting the twelfth thoracic because the twelfth has no rib attached, is not an accurate method. It is rare to observe only eleven ribs. Unfortunately statistics are not available to indicate the frequency of this condition. With regard to the patient who has spondylolisthesis, it should be mentioned that if the x-rays show a displacement of the fifth lumbar either forward or backward it is a true spondylolisthesis and cannot be denied.

References:

- Chandler, F. A.: Lesions of the "Isthmus" (Pars Interarticularis) of the Laminae of the Lower Lumbar Vertebra and Their Relation to Spondylolisthesis, *Surg., Gynec. & Obst.* 53: 273 (Sept.) 1931.
Meyerding, H. W.: Spondylolisthesis as an Etiologic Factor in Backache, *THE JOURNAL*, Nov. 26, 1938, p. 1971.

SULFANILAMIDE THERAPY FOR STREPTOCOCCIC SORE THROAT

To the Editor:—We have had a large number of streptococcic sore throats here which I have treated with sulfanilamide in the recommended dosages. In three of these cases I have had a subsequent hematuria, red blood cells after three weeks in bed still being passed in two. A slight afternoon fever up to 99 F. is present in all. There was no albumin or casts in the urine. The centrifuged specimens average about 50 red cells per high power field. Is this hematuria a complication of the throat infection or a sequela of the medication? What is the prognosis and treatment? I have thus far merely kept these patients in bed.

Irving Auld, M.D., Clintonville, Wis.

ANSWER:—It is well known that acute hemorrhagic nephritis frequently follows the occurrence of beta hemolytic streptococcus sore throat; hence any physician seeing a large number of persons with streptococcic sore throat would expect to see a certain number developing signs of acute hemorrhagic nephritis.

Although it is stated in the query that albumin has not been found, it would seem that there might be some form of nephritic reaction following the infection in the cases under discussion and that the hematuria should not be attributed to sulfanilamide therapy.

As far as the literature is concerned there are no definite reports concerning the appearance of hematuria in the course of sulfanilamide therapy, although hematuria is fairly common in the course of sulfapyridine or sulfathiazole therapy. It seems that the prognosis in the cases under discussion should be good. The treatment should consist of rest in bed, adequate fluids, an alkaline-ash diet and removal of infected foci.

In some clinics a considerable degree of success has attended the use of sulfanilamide in the treatment of acute hemorrhagic nephritis following a known beta hemolytic streptococcus infection. However, if the patient's kidney function is decreased, care must be taken in prescribing the drug in order that it does not accumulate in the tissues, because when kidney function is lowered sulfanilamide is not excreted in a normal manner.

KNOCKING KNEES FROM PARALYSIS AGITANS

To the Editor:—A woman patient is in her tenth year of paralysis agitans. On account of the constant spasm of her adductor muscles her knees are incessantly pressing together, causing redness and tenderness but not, thus far, ulceration. She has tried to relieve the knees by placing between them a thick soft pad of cotton and also a cotton pad with a hole in the center for sore bony projections to rest in but without much relief. I have tried to keep her knees apart by placing a wooden wedge between her thighs but she does not like it. What device do you suggest to relieve or prevent pressure of the knees and what medicinal application to the red skin do you suggest?

M.D., New York.

ANSWER:—A bland ointment may be used for the skin until pressure is relieved for sufficient time to permit it to heal. It is important to keep the skin surfaces from touching. The best treatment is the adductor tenotomy and obturator neurectomy with the application of casts to each leg and foot with a cross bar maintaining moderate abduction. The cast should go from the bases of the toes to a point above the knees. A brace can be made with cuffs above the ankles and above the knees and two cross bars.

SPLENECTOMY FOR CONGENITAL HEMOLYTIC ANEMIA

To the Editor:—What is the proper treatment for congenital hemolytic anemia with red count of less than 3,000,000? Beckman mentions only splenectomy, which a judicious surgeon has refused to do in the case under consideration. What about marmite or liver or stomach extracts by mouth or injection?

F. E. Dargatz, M.D., Kinsley, Kan.

ANSWER:—The only known specific therapy for congenital hemolytic anemia is splenectomy. Medical therapy, including the measures mentioned, and all other forms of antianemic treatment have not been found of any value. The results reported with splenectomy are excellent. The symptoms of anemia and jaundice, which are due to excessive destruction of the spherocytes in the spleen, are promptly and permanently relieved, although the spherocytes and increased cell fragility persist. Splenectomy is indicated if acute attacks of hemolytic jaundice occur or if the anemia becomes chronic and progressive. The operative mortality is relatively low, ranging from 6.5 per cent in adults to 11.5 per cent in children.

CATARRHAL OTITIS AND SUPPURATION

To the Editor:—Is it the general belief of otologists that sulfanilamide given in cases of catarrhal otitis media will frequently prevent a suppurative otitis media?

M.D., New York.

ANSWER:—It is difficult to say what the general belief of otologists is in answer to this query.

If, by catarrhal otitis, a mild inflammation in the middle ear is meant, then having made this diagnosis one should not expect suppuration to occur. Should an abscess arise in the ear when the diagnosis of catarrhal otitis was made earlier in the course of the illness, it would be better to revise the first opinion and say that a suppurative otitis existed in its early stages.

Catarrhal otitis, by definition being a condition which improves by itself and usually without the need of surgical intervention, would therefore not be prevented by treatment from becoming a suppurative process.

BARBITURATES AND LONGEVITY

To the Editor:—Is there any evidence that the frequent use of phenobarbital, soluble barbitol or the new barbituric acid derivatives has any effect on the length of life?

M.D. West Virginia.

ANSWER:—One cannot state that the frequent use of strictly therapeutic doses of a barbiturate shortens life by direct action. There are many factors concerned with longevity which are influenced adversely by the abuse of any of the barbiturates; hence the length of life must be influenced in many cases.

MENSTRUATION AND ALLERGY

To the Editor:—In *The Journal*, Feb. 10, 1940, page 513, there is an answer to a question about the relation of endocrine activity to premenstrual asthma. It is important to realize that bronchial asthma due to inhalants and particularly to foods may occur before, during or after the menstrual period. Such underlying allergy is activated by the menstrual cycle in such a way that various allergic manifestations are exaggerated or produced through the secondary influence of wind, heat, cold or other physical or emotional factors. Thus patients with asthma occurring only around the menstrual period should receive most careful study with the possibility of inhalant and particularly food allergy in mind. Careful cutaneous testing with proper hyposensitization therapy should be carried out, and food allergy should be studied with the aid not only of cutaneous reactions but also of trial diets over a considerable period. During such a period of diet trial, adequate protection of nutrition and weight must always be emphasized. Experience of allergists lends little evidence to the possibility that disturbances in ovarian functions are primarily responsible for bronchial asthma or for any other allergic manifestations.

Albert H. Rowe, M.D., Oakland, Calif.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Sixth Annual Meeting, held in Chicago,
Feb. 12 and 13, 1940

DR. RAY LYMAN WILBUR, Stanford University, Calif.,
in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 12—MORNING

Report of the Council on Medical Education and Hospitals

DR. RAY LYMAN WILBUR, Stanford University, Calif.: This
article appeared in full in THE JOURNAL, March 30, page 1141.

Addenda to the Agenda for 1940-1950

DR. ALAN GREGG, New York: This article appeared in full
in THE JOURNAL, March 30, page 1139.

The Goal of Medical Education

DR. IRVIN ABELL, Louisville, Ky.: This article appeared in
in THE JOURNAL, March 30, page 1146.

Graduate Work in Medical Areas

GEORGE D. STODDARD, PH.D., Iowa City: My remarks bear
the advanced work that a medical student, or a student
interested in medical problems, may undertake within the reg-
ular university plan. It is work which if pursued systemati-
cally may lead to the master's degree in one full year, or to
a doctor of philosophy degree in three years. I shall present
a few illustrations that may be helpful by way of opening the
discussion for further analysis. I shall mention one or two
centers in organization and research development at the
University of Iowa. Illustrations could be drawn from other
institutions, for none of us at Iowa feel that we have arrived
at any solutions. In working toward a master's degree in the
Graduate College we have been criticized because of insistence
on a minimum time requirement. No matter how brilliant and
purposeful the master's candidate, we require the measure of
a full year of work. This means that some students will go
indeed in the understanding and exploration of their sub-
ject matter. Conversely, at the subsistence level of academic
activity any graduate student seeking the master's degree will
be subjected to a year's trial. Nobody has to count credits
unless he feels like it. We are interested in a year of work
because we feel that this is something tangible, even predict-
able within limits, and a unit that encourages good planning
on the part of both students and staff members. The student
who has his M.D. registers in a single course, once for each
two semesters. A thesis is required. Advanced instruction
is given in cooperation with other departments of the College
of Medicine. Registration is in the Graduate College. This
gives the College of Medicine complete control over the
content and methods of the year's graduate work. In this
relationship the Graduate College is a kind of holding com-
pany that has access to the mysteries of degree granting and
advocation, together with limited funds in support of research
assistants and laboratory equipment.

We have few such arrangements in medical or other areas,
I believe that this one sets what is for us a desirable pat-
tern. One reason why we find it necessary to be credit minded
in some fields is that students are allowed to transfer from
one department and other institutions on such a casual basis
that the concept of a year's work is reduced to a quilt pattern
of small pieces. If a student would arrive at the beginning
of an academic year and stay there, we could dispense with
a large amount of credit counting and credit transferring
machinery. What we need is a genuine desire to add to one's
knowledge and fitness through authentic scientific experience;
and, as a corollary, to indulge the hope of making a contribu-
tion of some theoretical or practical significance.

It is not easy to organize medical departments for the
encouragement of graduate work on the part of staff members
and students. Staff members are frequently assigned heavy
teaching and clinical schedules, and to these may be added the
pressures of private practice and social service to the com-
munity. Given a subsidiary status, advanced work is almost
certain to languish. In many universities there is inadequate
support in the form of scholarships and research assistant-
ships; too little money for technicians, for apparatus, supplies
and publication. Much depends on the head of the department
and on the dean of the medical school, but in some universities
their combined power would not be sufficient to loosen the
strings of research support. A subtle deterrent appears in the
lack of interest in carrying on research or in providing research
opportunities for students. Of course this problem is not pecu-
liar to medicine. It may be that the research technics in some
fields have gone beyond the ability or experience of a particular
staff member or department head. He may, in effect, demon-
strate self protection in not starting something that would take
bright young students beyond his mental preserves. He may
have become skilful and truly wise in medical practice and
demonstration while growing rusty on the detailed methods of
mathematical, physical or chemical analysis.

There is no general solution. Some professors will show
great energy in the development of laboratory and other facili-
ties for advanced technical work. Others will feel that they
cannot afford to do this but will be happy to employ and guide
technical assistants and staff members. The test, after all, is
pragmatic. If, as the Council report says, there is some rela-
tion, presumably causal, between research production and gen-
eral medical excellence, we should do everything possible to
encourage the one, if only to advance the other.

The Council's report on medical education speaks of "the
elevated dignity of the profession." This unique place has
been maintained through medical standards and ethics slowly
built up over the centuries. Members of this congress know
better than any layman how close the ideal came to disap-
pearance in the pre-Flexnerian days of the multiplication of
medical schools and dangerous submarginal enterprises. There
is general agreement among educators that no profession, and
no area of public service, has done as well as medicine in
putting its technical and educational house in order.

The signs are plentiful that leaders in medicine are paying
heed to the powerful forces that cut across our national life.
I suppose, in the long run, the physician must give the people
what they want. In medicine, the validity of such wants can
always be established by the medical profession itself.

The medical student, some time during his academic career,
should secure a liberal education. The tendency has been
toward a standard baccalaureate curriculum. Possibly the pre-
medical career of many students involves a heavy proportion
of chemistry, biology and related subjects, such that the liberal
arts are really the subordinate or fundamental sciences on
which the structure of medical professionalism is to be erected.
Such students coming up through a technical curriculum may
have only a modicum of experience in the social sciences, eco-
nomics, sociology, psychology or public administration. Like
most students they will not feel at home in these areas and
may tend to reject or oppose social change as something
unscientific or radical.

Perhaps the education of a medical student, like that of other
highly selected professional groups, should be tripodic in char-
acter. It could be rooted in liberal education, in ancillary
education and in special education. Some subjects, like eco-
nomics, are probably no longer so much a part of the liberal
arts as originally conceived, as they are necessary mental
equipment for every person in the professions.

It is my feeling that the university has been negligent in
making available, at appropriate times and in useful sequence,
the insights needed by its professional students. It occurs to
me too that the problem cannot be solved by suddenly appear-
ing before a dean of medicine or a medical committee with
a proposal, springing from the liberal arts or graduate areas,
to add a semester or a year of courses to the already over-
loaded curriculum of the medical student.

The hope for the discovery of talent and for broad training
is not wishful thinking. The demand is here. The number

of physicians on full time payrolls has increased markedly over the past few decades. If this trend proves to be consistent with the patient's welfare, with professional standards and with public economy, we may expect it to endure. The question is not unrelated to individual psychology. The physician in training may increasingly prefer a ten to one chance on a \$5,000 guaranteed salary, with a ceiling perhaps two or three times as high, to a competitive society in which a substantial percentage of doctors earn less than \$3,000 while a handful get into the high income brackets.

We may agree that social or political reform should not be taken out of the hands of the medical profession. Rather the reverse is indicated, namely that the medical expert take such leadership into his own hands in order that whatever is done may be well done, on a durable and scientific basis. I enter a plea for the doctor as social scientist, and the doctor as a leading spirit in governmental affairs. I venture the prediction that with increasing governmental sponsorship of the activities of physicians there will come a reciprocal relation of the physician to the government. He will not dominate a government of laws, but his may be the determining voice. Practically this would mean in our city, state and federal governments a higher proportion of physicians and, I should hope, of scientists, of scholars and of creative artists.

Trends in Liberal Arts Education

GEORGE A. WORKS, Ed.D., Chicago: The last decade has been a period of pronounced flux in higher education. The conditions have been so fluid that it is not practicable to attempt to give a comprehensive view of the numerous adjustments and adaptations that are being made in curriculums and methods of instruction in the liberal arts. Colleges of liberal arts have been designating the first two years of their programs as lower division or junior college work, and the third and fourth years as upper division or senior college work. The first two years have been characterized by efforts to make them an extension of the general education of the secondary school. Several factors have contributed to this change in the nature of the work done during the first two years. First, the feeling of educators in the liberal arts that students were not obtaining the integrated view of life that should result from the study of the main disciplines. The marked extension of knowledge through research in all the fields of the arts and sciences in the last generation has been accompanied by a striking multiplication of courses in colleges and universities. With this growth of information there has been a tendency to segment minutely the different fields of knowledge, with the result that students have found it necessary to take a large number of courses in a subject if they are to have an overview of it. This had left them only limited opportunities to elect in other departments of knowledge. As a consequence, students who complete the work of a liberal arts college have not come out with the integrated outlook in the liberal arts that was possible in the colleges of fifty or seventy-five years ago.

In the difference between the limited offerings of those days and the ample offerings of the present time is to be found a partial explanation of why the college of liberal arts of the earlier day may have produced students with a more nearly adequate comprehension of the relationships among the major fields of learning than they get under the present program.

Another factor that contributed to the destruction of the unity of the college of liberal arts was the elective system. Recent years have witnessed a tendency to return to a greater measure of prescription than was generally followed a generation ago. These trends, prescription and the development of comprehensive courses that have been pointed out with reference to the freshman and sophomore years represent an effort to restore to the student a larger opportunity to secure that integration of knowledge which is believed to have characterized the earlier days of the college of liberal arts. Another force of a different character has had its influence. Reference is made to the student mortality in institutions of higher learning. The studies that have been made show that about half of the students leave college before completion of the requirements for the bachelor's degree. Most of this academic mortality occurs by the end of the sophomore year. This heavy

loss of students has raised questions regarding the values obtained by those students from the early years of an educational program developed with the emphasis on the preparatory value of the first two years of work for the specialization that characterizes the work of the junior and senior years in the liberal arts college. As a result, many colleges of liberal arts are revising their offerings of the first two years in the direction already discussed.

A further impetus to this revision has come from the view that the marked influx in recent years of students in higher institutions has been accompanied by a marked deterioration in the intellectual level of the entering freshman. I made a careful analysis of the studies in this field and was not able to substantiate the generally accepted point of view. This study appeared to justify the following statement: "The data available fail to show any appreciable deterioration in the intellectual quality of entering freshmen in those institutions where studies have been made on objective bases. In this respect the data are not in accord with the commonly expressed view on this subject. In making this interpretation it should be borne in mind that these studies are available over only a comparatively brief span. Perhaps if comparisons were available with the freshmen entrants of fifty or sixty years ago the story would be a different one."

Colleges need a period of comparative freedom from the requirements of professional schools to develop programs of instruction adequate for the needs of their student bodies. As to the trends at the senior college level, first there seems to be a tendency toward encouraging a greater breadth of preparation on the part of students. With the expansion of offerings by colleges, some minimum amount of specialization for each subject was designated or a minimum percentage of the senior college work that must be presented in the student's major subject was stipulated. This left the student free to carry his specialization as far beyond these minimums as he desired within the limits of his time and the offerings of his college. The influence of graduate schools, the requirements of professional schools and the desire of departments for students have had a tendency to cause students to increase their specialization to a marked degree at the senior college level. A reaction has set in and colleges are now taking steps to limit the degree of specialization at the senior college level.

A second trend at the senior college level is the comprehensive examination, which has been in use in a few institutions for some years. Through the comprehensive examination it is hoped that the student will be brought to synthesize his knowledge as he grows in his acquaintance with the several disciplines. It is regarded as a means of getting the student to realize the importance of securing a working unity in his learning. It is still in the experimental stage.

Other trends in liberal arts education are evident. Illustrations are furnished by the growth of the tutorial system and other means of individualization of instruction, adaptation of curriculums and instruction to the abilities and needs of the individual, and a growing recognition that the student should be aroused to a realization that all education is self education.

A word of warning should be given regarding the prevalence of those trends that have been discussed. Institutions will be found in which one of the trends is not only lacking but is opposed by the faculty and administration. There may be cases in which not one of them is considered to be a desirable feature. Fortunately, the American college of liberal arts is not cast in a mold of complete uniformity.

The final phase of this discussion is a consideration of pre-medical requirements. Medical colleges specify subjects which they require for admission and these vary from school to school. The differences are not great enough to be of marked importance were it not that each student usually applies to several schools for admission and as a result his program in the liberal arts college is determined not by the requirements of any given school but by the least common multiple of the requirements of several schools. It is evident that medical schools have two sets of requirements for admission, one quantitative and the other qualitative. In the past much of the emphasis has been placed on the quantitative requirements. The colleges of liberal arts welcome the signs that medical schools are shifting their attention from the quantitative to

the qualitative requirements. It will leave to liberal arts colleges a greater degree of freedom in pursuing their objectives. It is suggested that medical schools may turn to colleges of liberal arts for more assistance regarding the qualitative characteristics of applicants. These colleges would welcome such a movement, as many of the qualities that will be specified are certain to have a wholesome reaction on students when made known to them during their period of undergraduate study.

FEBRUARY 12—AFTERNOON

DR. JOHN H. MUSSEY, New Orleans, in the Chair

Program for the Instruction of Interns

DR. NATHAN B. VAN ETEN, New York: In presenting a pictorial study of intern education we are making a record of obedience to the requirements of the Council on Medical Education and Hospitals and of the College of Surgeons. The Morrisania Hospital is one of the twenty-six municipal hospitals of the city of New York. Its normal bed capacity of 539 is frequently exceeded, and with an average patient stay of nine days a large clinical procession is reviewed by its interns and residents. Its student body is composed of fourteen residents and thirty-four interns, a ratio of interns to patients of one to fifteen. In order to qualify for endorsement, an effort has been made to carry out in detail the letter and the spirit of the Council's requirements and to go further into the field of educating interns in the practicalities of medical care, in order to prepare them for similar problems which may later appear in their private work.

Medical education is far from a finished procedure, partly because it attempts to do too much through the long years devoted to it. In spite of eight college years required for the march to the degree of doctor of medicine, so much time is taken from the serious business of teaching practical clinical doctoring of real people, by diverting their attention to smatterings of specialties, that they are confused young people when they get their degree.

At the Morrisania we are impressed with the fact that few new interns have a practical understanding of a medical career. The Council undoubtedly desires to raise the quality of medical education. It will be a real accomplishment if it can raise the level of medical intelligence of the average doctor to fit him for better care of the average patient.

The average doctor must not be frightened out of confidence in his ability to take care of the average surgical, obstetric or medical problem. The general practitioner is one of the most valuable citizens in this republic, and the right kind of education must be aimed at him. The force of opinion may demand a better practical education for the general practitioner so that he may be able to render better medical service to low income people. The Council would probably do well to resurvey all medical schools to discover failures to solve this problem. The Council has the equipment, personnel and funds to do this work and I believe should be encouraged to undertake it.

Ten years ago a young man entered the administrative service of our hospital and so quickly showed an unusual interest in intern training that the executive direction of it was assigned to him. Although every encouragement was given to inquiring minds, the greatest emphasis was placed on the practical application of medical knowledge.

In 1936 Dr. Nathan Smith developed a scheme for intensive training in the outpatient department where the intern could closely observe ambulatory patients, such as he might meet in his own office. This has proved to be a successful adventure into reality.

[Dr. Nathan Smith's discussion of the motion picture will appear in the Student Section of THE JOURNAL.]

Medical Education—1905 to 1940

DR. MORRIS FISHBEIN, Chicago: This article appeared in full in THE JOURNAL, March 30, page 1147.

The Navy Looks at Education

DR. H. W. SMITH, Washington, D. C.: The Navy is not directly concerned with any system of undergraduate instruction. But, since it takes the product of the current system, we are interested in how well that product is being prepared

to function in the Navy and we are in position to observe a cross section of it. One reason why private practice is the lagging member of modern medicine is that ungoverned specialization dominates the field of education. Specialization to the degree of provincialism has become a feature of our educational system. Of the candidates taking the examinations of the National Board last June, the ten making the highest average grades in part I included seven men from two schools, whereas the ten making the highest average grades in part II included only one from the two schools, and he was not among those listed in the honor roll for part I. May it not be relevant that in our ten leading medical schools 40 per cent of their faculty members have only a doctor of philosophy degree? Are not instructors such exclusive specialists that our students have disjunction set before them as a normal pattern?

To restore coordination to our faculties, it will be necessary to depart from a principle of medical education quoted in the recent report of this Council: ". . . that in the medical sciences, such as anatomy and physiology, there must be experienced teachers, trained in their respective subjects, rather than practicing physicians . . ." Conforming to this principle, exclusive specialization has been the rule in teaching institutions since 1914; and I believe it to be a result that graduates are well instructed in preclinical subjects as independent entities but are not practiced in bringing those subjects into relation with one another and with the symptom complex presented by the patient. Certainly we find our candidates deficient in clinical application.

The one practicable expedient is to adopt some principle which shall guide us in framing an educational system and also serve the graduate in his practice. The principle suggested is, in substance, coordination designed to correct the dispersive effects of specialization. Imbued with that doctrine, the physician will extend his cognizance to all conditions that might affect the life of a patient. In referring to that principle, I have borrowed from Jan Smuts the term "holism" to express the view that the morbid unit is the whole individual and not a constituent part. A point of view is to be planted and nurtured in each student. His outlook thereby will be immeasurably widened, and the realization so gained of the extent of his field of endeavor will effectually prevent his mind from ever becoming shut in one little compartment of medicine or being engrossed in one aspect of a case.

The more important phase of the general problem is not how to broaden the specialist but how to equip the general practitioner that he may serve acceptably when the services of specialists are not procurable. As you know, the farmer, the share cropper, the migrant worker, the slum dweller and the unemployed are fast assuming status as wards of the government; and study is being given to measures for bringing to those elements as high a standard of medical service as is available to others more fortunately situated. This project directly concerns every physician and student, for, unless the profession itself can find ways of bringing about a more uniform distribution of effective medical service conformable to current ideologies, alien agencies will intervene. Because of contemporary social and political trends, I suppose there is no more pressing problem in medical organization today.

The Navy at an early period encountered this sort of difficulty. Members of the medical corps must on occasion conserve the health of personnel without any of the adjunct services available in our medical centers.

Because of our experience I presume to suggest an answer to the question of how the scheme of medical education may be altered to the end that geographic and financial inequalities in the availability of efficient service may be compensated. The answer I suggest to this phase of the problem is the same as that which I have proposed for provincialism among specialists: the inculcation of a controlling doctrine to make each physician aware that his mission is to contribute to the maintenance in individuals of an ideal state we term "health," and that he is not fulfilling his duty unless, so far as humanly possible, he restores his patients to full function. It may be even that our hospital staffs should be reorganized to the better attainment of this desirable end. If the physician starts out on his career with good basic training and is guided thereafter by a conception of the patient-person, the condition

beyond his remedying will be few. The country practitioner may now and then lose a patient who might have been saved by early recourse to a specialist, but the ninety and nine patients who would elsewhere be treated by specialists will be restored to health equally well by him through intelligent application of his limited resources.

In 50 per cent of patients resorting to a doctor there is no physical lesion demonstrable then or later; and, in 75 per cent, psychic disorder is the chief if not the sole factor of morbidity. Therefore it is reasonable to expect that the practitioner, habituated to our doctrine of holism, may be as successful as the typical specialist or even the clinic.

How can this principle be incorporated in formal education? At the Naval Medical School I discontinued all systematic and schismatic instruction in the basic sciences—chemistry, bacteriology and pathology. Utilizing the time gained, I instituted two weekly exercises, one in clinical medicine and one in clinical pathology, with a senior internist acting as chairman and all instructors participating. At each exercise, the case of the day is presented by a student officer. Then each instructor in turn discusses phases pertaining to his subject. The chairman finally reviews the case briefly. By selection of cases not only is the whole range of medicine reviewed but all the ancillary subjects related to one another and to the individual patient. Thus the habit of comprehensive regard is firmly rooted. In an undergraduate school the sciences cannot be eliminated but they can be related. The unifying concept frequently put into operation becomes a lasting force through which the proper goals of medicine have been more fully attained.

The Work of the National Board of Medical Examiners During Its First Quarter Century

DR. LOUIS B. WILSON, Rochester, Minn.: When the National Board of Medical Examiners was founded in 1915, by Dr. William L. Rodman, he stated its aims and purposes to be "to establish a standard of examination and certification of graduates in medicine for the whole United States and its territories through which by the cooperation of the state and territorial boards of medical examiners its licentiates may be recognized for licensure to practice medicine." The present personnel consists of two representatives from each of the three federal medical services, two from the Council on Medical Education and Hospitals of the American Medical Association, three from the Association of American Medical Colleges, five from the Federation of State Medical Boards, and twelve elected members. In addition to the central board, a large number of highly efficient subsidiary boards were organized in 1922, largely for conducting part III examinations in widely separated cities.

After careful study of the detailed report of its commission and the valuable suggestions from its visitors from abroad, the National Board in 1922 changed its examination plans. The examinations were divided into parts I, II and III. Part I is given at the end of the first two years of the medical curriculum, part II immediately after graduation and part III after one or more years of internship. Part I covers mostly the basic medical sciences, part II covers mostly the theory of clinical medicine and part III covers the application of the medical sciences in diagnosis and treatment and a practical test of the candidate's clinical knowledge. This plan is based largely on the long experience of English and Scottish boards. Parts I and II are based entirely on written examinations to preserve a strictly uniform national level. The practical feature of the part III examination has required the organization of carefully selected local subsidiary boards in many large cities throughout the country. These subsidiary boards are composed almost entirely of local physicians. Eighteen years of experience with this system has thoroughly demonstrated the wisdom of the plan.

I am not suggesting that the National Board of Medical Examiners is omniscient concerning essential requirements for a high grade of general practice, that it is entirely unprejudiced concerning the relative emphasis which should be placed on the several phases of the candidates' professional attainments, that its plan of examination has no defects or that it is infal-

libe in evaluating all candidates' professional knowledge; but its final judgment of the candidate's fitness to practice general medicine is based on a careful study of the requirements for general practice and a reliable evaluation of each candidate's attainments in these professional qualifications. The certified diplomates of the Board have proved by their subsequent professional practice that their certification was warranted. Although the number of candidates has increased to more than 1,200 a year, this represents less than one fourth of the annual graduates. It would seem that ways should be found to permit at least two thirds of the graduates of American medical colleges to take the examinations. Although the fee for examinations is not large, it is more money than is available to many recent graduates. The question arises whether some provision from outside sources might not be made to permit schools to subsidize their higher grade but financially embarrassed graduates so that more of this group might take the examinations.

The greatest accomplishment of the National Board in its first quarter century has been the attainment of the objective specified by its founder. The diploma of the National Board is now more widely accepted by licensing bodies than a certificate of passing any other examination in the world. Almost all states and territories now accept its examinations in whole or in part in lieu of their own examinations. The same is true of the federal medical services. It is true of the qualifying boards of England, Scotland and Ireland. Indeed it is also true of a number of medical schools, which now accept in part or entirely the examinations of the National Board in lieu of their own examinations for graduation.

Eleven years ago the National Board expanded its small bulletin into a publication of greater size under the name of the *Diplomate*, the most significant activity of which from the standpoint of this congress would seem to be its publication of the results of each examination soon after its completion. One of the best uses which can be made of the published data of the National Board concerning success in the several basic sciences of graduates from various schools is its consideration by prospective medical students. A number of young men who have consulted me concerning which school to go to have said that they have read the files of the *Diplomate* and been much impressed by the suggestive matter which it contains. Many of the specialty boards have modeled certain phases of their examinations on those of the National Board. The accomplishments of the senior specialty boards so far have thoroughly justified their existence.

Any national examining board must base its standards and methods on educational standards and clinical practice. These factors are anything but static. There is perhaps too great a tendency to continue emphasis on some factors the clinical significance of which has become obsolete. But age old traditions should be changed with great caution. Increased emphasis on newly discovered phases of basic medical science and clinical practice is sometimes as difficult to develop as is the reduction of emphasis on factors that are becoming obsolete. Neither of these things can be accomplished by an examining board without cooperative action between educational institutions and organizations of clinicians. Although national boards may suggest changes by their examination questions, the whole problem can be solved only by cooperation on a national basis between all agencies concerned in the improvement of the practice of medicine. Such cooperation should be the subject of careful consultations by the American Medical Association, the Association of American Medical Colleges, the Federation of State Medical Boards and all national boards of medical examiners, general or special.

American Contributions to Medical Education in China and India

DR. EDWARD H. HUME, New York: For more than a hundred and twenty years, American physicians have taken part in medical work in Asia. From the beginning, Americans in China have had to discover that China was the home of an ancient culture whose patterns in trade, in social relations and in education had been set for centuries. They little understood the extent of the shock caused to Chinese nationality by their intrusion into the manifold life of this old country. In A. D. 1068, two years after William the Norman entered

tain, the great emperor Shen Tsung of the Sung dynasty ordered state medical schools to be created. The examinations were definite: one on the principles and one on the clinical practice of medicine and surgery, one on physiology and anatomy, one on differential diagnosis by the pulse and one on prescriptions and therapeutics.

The first American physician of whom we have record was Dr. Bradford of Philadelphia, who aided in the conduct of free dispensary at Canton. By 1830 the first American missionaries to reside permanently in China arrived in Canton, Elijah C. Bridgman, the pioneer appointee of the American Board of Commissioners for Foreign Missions, with his colleague David Abeel.

Modern medical teaching in China began in the Canton Hospital, where Peter Parker did his work. In 1870 a class of regular medical students was admitted and the translation of textbooks taken up in earnest. In 1879 Chinese women students were first admitted. The medical work of these pioneers is noteworthy not only because their medicine and surgery recommended themselves to the Chinese but because they launched opium refuges, fought against the old practice of foot binding and took part in the training of medical assistants and nurses. In January 1896 an agreement was entered into between St. John's College and Dr. Boone, whereby the Medical School of St. Luke's became the Medical Department of St. John's College. The purpose now was to train physicians and surgeons of a higher grade in English; the course was one of four years, at the end of which a certificate was granted to successful candidates. Medical education in Peiping began in 1896. In 1894 a coeducational medical college was started at Soochow. Another medical class was started in 1899 at Ichow. One of the definite purposes of these early teachers was the supply of proper Chinese textbooks. The first Protestant nurse to reach China was Miss Elizabeth McKechnie, who arrived in Shanghai in 1884. By 1907 Miss Cora E. Simpson, an American nurse, launched the Florence Nightingale Nurses' Training School. By 1922 the members of the China Medical Missionary Association were giving serious thought to unified programs in medical education. At a conference in Hankow in February 1910 the first Chinese was admitted to active membership in this association. By 1921 the total number of medical colleges in China was twenty-four. Eleven of these were Chinese government or private institutions, eleven were controlled by Westerners, and two were under cooperative direction. Of the eleven under Western control three were entirely American, while three were jointly staffed by Americans and British. Both the cooperative institutions were launched by Americans working with Chinese physicians. These were the Kung Yee Medical School in Canton and the Hunan-Yale Medical College in Changsha. Thus in eight of the eleven institutions of note in China, a score of years ago, Americans were providing both staff and financial aid.

The Peking Union Medical College, dedicated in 1921, was the outgrowth of a plan launched in 1906 by Dr. Thomas Cochran, who united the teaching units of the American Congregational, the American Methodist and the American Presbyterian teaching hospitals with those of two British societies in North China to form a single teaching center. In 1914 a medical commission from the Rockefeller Foundation visited China. On the basis of its report there was formed the China Medical Board of the Rockefeller Foundation. In the summer of 1915 this board sent out another commission, which recommended cooperation with the existing Peking Union Medical College, taking over its land and buildings and agreeing to provide the maintenance and construction costs for a new institution. Thus the work of three American and two British missionary societies, which had been consummated in 1906 and where the first medical class graduated in 1911, found its life continuing in the new center, which has been a landmark in the old Chinese capital for twenty years both because of its architectural beauty and because of the comprehensiveness and thoroughness of its educational plan. No other medical school in the Far East surpasses the Peking Union Medical College in the caliber of its staff and its teaching program.

Six medical schools in China today represent the participation of American educators: 1. Cheeloo University Medical School at Tsinan. 2. St. John's University School of Medicine at

Shanghai, one of the oldest in China. About thirty years ago a group of graduates of the University of Pennsylvania, who had started work in Canton, moved to Shanghai and became the faculty of medicine of St. John's. The institution is designated the Pennsylvania Medical School of St. John's University. 3. Women's Union Medical School at Shanghai. This institution, founded by the Women's Union Missionary Society of America, suffered great damage when the Japanese aggression began in 1937, and the work is now being carried on within the foreign settlement. 4. The Hunan-Yale College of Medicine at Changsha, started in 1914 by an American and a Chinese group of educators working together; the first dean was Dr. Edward H. Hume, a graduate of Johns Hopkins. Since the war with Japan began, it has been necessary to move the institution to the capital of the adjoining province of Kweichow. In this interior city of Kweiyang the college is pressing forward with a reduced budget but with increased morale and with a unique opportunity for service in the area behind the lines. 5. West China Union University Medical School at Chengtu, which was founded more than twenty years ago by a group of American, British and Canadian doctors. 6. The Sun Yat-sen Medical School in Canton. The war has driven the teaching aspects of this work out of Canton. Some of it is being done in Hongkong, through the courtesy of the University of Hongkong, while some of the clinical teaching is carried on at a smaller town in the north of Canton province.

Each of these seven centers is an outpost of North American medicine, in which British teachers have also taken an active share. In the years during which these institutions were growing, the government too became active in the field and laid the foundations for great teaching centers in a number of important Chinese provincial capitals. Without exception these Chinese institutions have moved west because of the pressure of the Japanese invasion. They have now taken up their work in cooperation in three important provincial capitals in the Far West. Continued Japanese control of parts of eastern China may prevent the return of these schools to their original bases. On the other hand, the Japanese attack has opened up new vistas for the whole field of medical education, as it has for education in other fields and for social and industrial development. The president of the Chinese Medical Association has invited American universities to share in building up senior teaching staffs for three of these West China government centers. There may be experienced American medical teachers who would be willing to take a sabbatical leave, others who are approaching retirement and who would welcome a chance for new service, and still others who might be interested in an adventure to teach in free China, which is facing the adversities of war. The six schools in which North Americans are working are continually seeking replacement for their staffs.

The first American physician to begin work in India was Dr. John Scudder, who went there in 1819, did dispensary work and later gave himself more definitely to church work. Since that early date hospitals have been started in many parts of India, until the total of North American hospitals (including Canada and the United States) in 1936 was about 100. The situation in India differs from that in China with regard to medical education. In China, practically all beginnings of modern medical work were launched by missionaries, in hospitals or dispensaries, in medical schools or nurse training schools, and in other forms of health activity. In India the British government has built up a widespread program of hospital and dispensary work and of medical education. At first all training was given in medical schools, this term being used to connote institutions whose graduates had a license to practice but were not trained in the fundamental sciences or given a university degree. Within the past twenty years the more advanced provinces have launched universities, with schools of law, medicine and engineering, where a higher degree has been conferred on graduates. University teaching institutions are spoken of as medical colleges, to distinguish them from the medical schools already mentioned.

To Sir William Wanless, M.D., was due the founding, about forty years ago, of a medical school at Miraj in western India, controlled and supported wholly by the Presbyterian Board in the United States. It is a question whether, with the limited facilities for the teaching of anatomy, physiology, pharmacology

l other basic sciences, and with the too infrequent possibility postmortem examinations, this institution should attempt to a medical school much longer. It is adapted, rather, to give ordinary service as a hospital capable of training men for : far-flung rural health program so vitally needed every- re in India.

t Vellore in South India a similar type of teaching was ted three decades ago by Dr. Ida S. Scudder, granddaughter he pioneer medical missionary to India. Although it was blished in the first instance as a project of the Reformed rch in America, other societies joined the movement, until a cooperative Union Medical School for Women came into being. It has done notable work during the past twenty years and its graduates, all women physicians, are to be found in many parts of India. Up to 1937 the future of the Vellore Medical School seemed fairly secure, but in that year the government of the province of Madras, educationally the most advanced province in India, passed a ruling that there should hereafter be no more "medical schools" in the province but that only "medical colleges" should be recognized. The government gave effect to its own decision by closing up its own large women's medical school in the city of Madras and combining its staff with another medical school in that city, raising the combined institutions to the level of a medical college with university status. The Vellore school is now put on notice that, after the graduation of the present student body, no further students may be admitted at the old level. The institution must be stepped up to the level of a medical college of university grade, with the necessary staff, laboratories, bed facilities and variety of material.

Another school for women was started in Ludhiana, in the province of Punjab, at a point as far north in India as Vellore is south. This institution was largely the work of Dr. Edith M. Brown, an Englishwoman who has been successful in building up a teaching center whose staff consisted of Americans, British and Canadians. Punjab University, located at Lahore, the capital of the province, has recently granted recognition to the two lower classes of the institution and approved their being given university status. Whether the entire institution can be stepped up to the university level and gain recognition as a medical college remains to be seen. The obstacles are largely financial.

These three institutions—Miraj, Vellore (both American in establishment) and Ludhiana (British in management but with an international teaching staff)—will have to make radical changes during the years ahead. The governments of the several provinces are making fairly large provision for provincial medical teaching institutions, and it is likely that they will be unwilling to give grants to institutions conducted by other agencies. This situation would throw an almost intolerable burden on the three institutions. The Christian Medical Association of India, which unites those of Indian and Western nationalities in a large agency for dealing with all the problems involved, is strongly of the opinion that the Christian forces should maintain a medical college in India (that is, an institution at the university level) and that there should be but one such institution. Difficulties of transportation and language grow progressively less, and the missionary boards in Great Britain and North America can scarcely afford the cost of more than a single institution at the high level. If such a center should be agreed on it would have to be located in some appropriate place, while the other institutions which have taught in the past would remain in the picture by taking up some special medical feature of training, whether rural or other work. Major General E. W. C. Bradfield, the director of the Indian Medical Service, and other surgeon generals in the various provinces continue to insist that the work of medical missions is indispensable in a total health program for the land; but they urge that it seek out those fields of activity in which no government force can compete. These government officials suggest that the mission hospitals place increased emphasis on health work in the vast rural areas of India, giving special attention to chronic diseases. These suggestions are receiving the attention of all in the United States and Canada who are concerned with North America's share in medical education in India.

America has been at its best in pushing back horizons. Today there is set before us an opportunity to pioneer still further to the west. There is a new call for expansion in the use of our

medical resources. This call for internationalism in medical education will include all the emphasis in that field which is being made by the Council on Medical Education and Hospitals. But more! Those who are to go overseas need special preparation, as in the field of tropical medicine. American contributions to medical education overseas have scarcely crossed the threshold of this new opportunity. We are offered here a fresh challenge to thought and constructive planning in a significant professional and social field.

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, March 30, page 1288.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part II, May 1-2; Part III, June or July, to be given in medical centers having five or more candidates desiring to take the examination. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral. Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: November 1940. If a sufficient number of applications were received before March 1 an examination will be held at New York, June 10-14. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Oral. In advance of the meeting of the American Medical Association. Applications must be on file six weeks in advance. Written. October 21. Applications must be on file by September 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral and pathologic examinations (Part II). (Group B) will be conducted in Atlantic City, N. J., June 7-10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Oral. New York, June 8-10; Cleveland, Oct. 5. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Chicago, June 15-16. Applications must be on file on or before April 15. Sec., Dr. Fremont A. Chandler, 6 North Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: New York, June 10-11. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: Memphis, Tenn., Nov. 17, preceding the annual meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Cincinnati, May 17-18. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: New York, June 7-10. Sec., Dr. Byrl R. Kirklín, 102-110 Second Ave., Rochester, Minn.

AMERICAN BOARD OF SURGERY: Various centers, April 1. Sec., Dr. J. Stewart Rodman, 225 South Fifteenth St., Philadelphia.

New York Endorsement Report

Mr. Herbert J. Hamilton, chief, Bureau of Professional Examinations, reports seventy-nine physicians licensed by endorsement from Nov. 15 through Dec. 20, 1939. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement of Grad.
Yale University School of Medicine	(1938)	N. B. M. Ex.
George Washington Univer		Puerto Rico
Howard University College		New Jersey
Northwestern University Medical School	(1938)	Wisconsin
Rush Medical College	(1923) California, (1935)	Wisconsin
(1937), (1938, 2) N. B. M. Ex.		
Indiana University School of Medicine	(1935, 2), (1937)	Indiana
State University of Iowa College of Medicine	(1929), (1936)	Iowa
Louisiana State University Medical Center	(1933) N. B. M. Ex.	Alabama
Johns Hopkins University School of Medicine	(1932) N. B. M. Ex., (1934), (1939) Maryland	
University of Maryland School of Medicine and College of Physicians and Surgeons	(1937, 2), (1938, 2), (1939, 3) Maryland	
Boston University School of Medicine	(1938) N. B. M. Ex.	
Harvard Medical School	(1927), (1937, 2) N. B. M. Ex.	
Tufts College Medical School	(1933) N. B. M. Ex.	
St. Louis University School of Medicine	(1937) N. B. M. Ex., (1938, 4), (1939, 3) Tennessee	
Creighton University School of Medicine	(1936)	California
Cornell University Medical College	(1931), (1936) N. B. M. Ex.	
New York Homeopathic Medical College and Flower Hospital	(1913), (1935)	New Jersey
New York Medical College and Flower Hospital	(1937, 2), (1938, 2) N. B. M. Ex.	
New York University College of Medicine	(1934)	N. Carolina

Eclectic Medical College, Cincinnati.....(1938, 3), (1939, 4)	Ohio	Medizinische Fakultät der Universität Wien.....(1913)	614
University of Cincinnati College of Medicine.....(1939)	Ohio	(1916) 63.7, (1922) 65.3, (1924) 52.3, 71.4, (1925)	
Western Reserve University School of Medicine.....(1937)	Ohio	69.6, (1934) 63.4	
Hahnemann Medical College and Hospital of Philadelphia.....(1938) Maryland, (1939)	Virginia	Albertus-Universität Medizinische Fakultät, Königsberg (1925)	711
University of Pennsylvania School of Medicine.....(1935) N. B. M. Ex.		Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....(1911) 69.5, (1927)	657
Woman's Medical College of Pennsylvania.....(1936)	N. Carolina	Julius-Maximilians-Universität Medizinische Fakultät, Würzburg.....(1910)	712
Meharry Medical College.....(1939)	Tennessee	Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau.....(1926)	631
Baylor University College of Medicine.....(1936)	Texas	Universität Leipzig Medizinische Fakultät.....(1933)	722
Medical College of Virginia.....(1937), (1938), (1939, 2)	Virginia	Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pécs.....(1930)	593
University of Virginia Department of Medicine.....(1927), (1938)	Virginia	Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest.....(1918)	346
University of Wisconsin Medical School.....(1933)	Wisconsin	Regia Università di Napoli Facoltà di Medicina e Chirurgia.....(1932)	653
Laval University Faculty of Medicine.....(1935)	Ohio	Regia Università degli Studi di Bologna, Facoltà di Medicina e Chirurgia.....(1937)	701
Medizinische Fakultät der Universität Wien.....(1912)	Maryland	Regia Università degli Studi di Messina, Facoltà di Medicina e Chirurgia.....(1937)	562
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....(1919), (1923)	Ohio	Regia Università degli Studi di Padova, Facoltà di Medicina e Chirurgia.....(1935)	687
Regia Università di Napoli Facoltà di Medicina e Chirurgia.....(1936)	Maryland	Regia Università degli Studi di Palermo, Facoltà di Medicina e Chirurgia.....(1920)	451
Licentiate of the Royal College of Physicians and of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow.....(1937)	Texas	Regia Università degli Studi di Roma, Facoltà di Medicina e Chirurgia.....(1937) 62.4, 69.8	
		Regia Università degli Studi di Siena, Facoltà di Medicina e Chirurgia.....(1937)	65
		Osteopaths.....57, 66.5, 68, 69, 70.5	

New Jersey October Examination

Dr. Earl S. Hallinger, secretary, New Jersey State Board of Medical Examiners, reports the written examination held at Trenton, Oct. 17-18, 1939. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. One hundred and fifty-five candidates were examined, 123 of whom passed and thirty-two failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine.....(1938)	78.4		
George Washington University School of Medicine.....(1937)	75.5*		
Georgetown Univ. School of Medicine.....(1938) 77.5, 79.3, 79.8, 82.4, 86.1	86.1		
Loyola University School of Medicine.....(1938) 83.2, (1939)	82.7		
Rush Medical College.....(1937) 82.3, (1938)	80.6, 87.4		
University of Illinois College of Medicine.....(1937)	88		
Louisiana State University Medical Center.....(1939)	80.2		
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1938)	76		
Boston University School of Medicine.....(1924)	77.6		
Harvard Medical School.....(1935) 83, (1936)	84.4		
University of Michigan Medical School.....(1936)	89.6		
University of Minnesota Medical School.....(1938) 89.2, (1939)	83.2*		
St. Louis University School of Medicine.....(1938)	77		
Cornell University Medical College.....(1935)	83.1		
Long Island College of Medicine.....(1938) 77.8, 79, 85.5	85.5		
New York University College of Medicine.....(1938)	83.3		
Hahnemann Medical College and Hospital of Philadelphia.....(1938) 76, 79, 79.1, 80.1, 80.5, 81.3, 86.4, 86.6	86.6		
Jefferson Medical College of Philadelphia.....(1937)	81.3,		
85.3, (1938) 80.6, 81.5			
Temple University School of Medicine.....(1937) 76.6, (1938)	78.8		
University of Pennsylvania School of Medicine.....(1936)	85.6,		
(1937) 80.3, 88.6, (1938) 76.5			
Woman's Medical College of Pennsylvania.....(1938)	78.5		
Marquette University School of Medicine.....(1940)	75.6†		
Medizinische Fakultät der Universität Wien.....(1916)	75.4,		
(1918) 75.1, (1921) 75.4, (1926) 76.4, (1929) 76.1, (1930) 76.8, (1933) 75, 77.4, 78.3, (1937) 80.8			
Université Libre de Bruxelles Faculté de Médecine.....(1938)	79.7		
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....(1926)	78		
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen.....(1921)	76.8		
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....(1908) 77.1, (1930)	83.4		
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....(1937)	77.7		
Schlesische-Friedrich-Wilhelm-Universität Medizinische Fakultät, Breslau.....(1911) 75.7, (1921)	81.5		
Universität Zürich Medizinische Fakultät.....(1914) 77.6, (1924)	75.3		
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pécs.....(1936)	83.6		
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest.....(1924) 77.2, (1928)	76.5		
Regia Università di Napoli Facoltà di Medicina e Chirurgia.....(1936)	75		
Regia Università degli Studi di Bologna, Facoltà di Medicina e Chirurgia.....(1936)	78		
Regia Università degli Studi di Padova, Facoltà di Medicina e Chirurgia.....(1937)	77.5		
Regia Università degli Studi di Roma, Facoltà di Medicina e Chirurgia.....(1936) 80, (1937) 75.8, 76.5, 80.3	82.8		
Universitatea Regele Ferdinand I-ii din Cluj Facultatea de Medicină si Farmacie.....(1923)	76.7		
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow (1938)	79.4,		
81.3, 83.1, 83.4			
Universität Zürich Medizinische Fakultät.....(1935)	76.5,		
(1937) 77, (1938) 78.3			
Université de Genève Faculté de Médecine.....(1935)	80.4		
Université de Lausanne Faculté de Médecine.....(1935)	79.8		
Osteopaths.....75, 75.5, 75.5, 76, 77.5, 77.5, 78, 78, 78.5, 78.5, 78.5, 80, 80, 80, 80.5, 81, 83, 83.5, 84.5, 85.5, 86, 86.5, 86.5, 87, 87.5, 87.5, 89.5, 91, 92	86.5,		

School	FAILED	Year Grad.	Per Cent
Georgetown University School of Medicine.....(1938)	71.7		
Temple University School of Medicine.....(1938)	70.2		
Karl-Franzens-Universität Medizinische Fakultät, Graz.....(1920)			

New Jersey Endorsement Report

Dr. Earl S. Hallinger, secretary, New Jersey State Board of Medical Examiners, reports 161 physicians licensed by endorsement for the year 1939. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement of
University of Arkansas School of Medicine.....(1937)	New York	
College of Medical Evangelists.....(1938) N. B. M. Ex.	California	
University of California Medical School.....(1933)	N. B. M. Ex.	
Yale University School of Medicine (1908) New York, (1936) N. B. M. Ex.	Maryland	
Georgetown University School of Medicine.....(1933)	Dist. Colum.	
Howard University College of Medicine.....(1927)	Penn.	
(1936) Missouri	Georgia	
Univ. of Georgia Medical Department (1914) Georgia, (1928)	Indiana	
University of Georgia School of Medicine.....(1934)	Iowa	
Indiana University School of Medicine.....(1937), (1938)	Kentucky,	
State University of Iowa College of Medicine.....(1935)		
University of Louisville School of Medicine.....(1935), (1937)		
(1937) New York, (1936) N. B. M. Ex.		
Johns Hopkins University School of Medicine.....(1935, 2)	Maryland	
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1934), (1938)	Maryland	
Boston University School of Medicine.....(1935), (1936) N. B. M. Ex.	New York	
Harvard Medical School.....(1929)	New York	
(1934, 2) N. B. M. Ex., (1935) Massachusetts		
Tufts College Medical School.....(1932)	Michigan	
University of Michigan Medical School.....(1929), (1936)		
(1932) N. B. M. Ex., (1936) New York		
Detroit College of Medicine and Surgery.....(1920)	New York	
St. Louis Univ. School of Medicine (1936), (1937), (1938, 2)	Missouri	
Creighton University School of Medicine.....(1936)	Connecticut	
Columbia University College of Physicians and Surgeons.....(1933), (1934), (1936, 2), (1937), (1938)	New York	
(1934), (1937) N. B. M. Ex., (1935) Massachusetts		
Cornell University Medical College.....(1933)	California	
(1900), (1929), (1937) New York		
Long Island College of Medicine (1931), (1935, 3), (1936, 3), (1937, 2) New York, (1931) N. B. M. Ex.		
Long Island College Hospital.....(1901), (1920)	New York	
New York Med. College and Flower Hosp.....(1937, 3), (1938) N. B. M. Ex.		
New York Homeopathic Medical College and Hospital (1934) N. B. M. Ex.		
New York University College of Medicine (1935, 3), (1936, 3), (1937), (1938) New York, (1937) Maryland		
University and Bellevue Hospital Medical College (1914), (1929), (1930), (1933) New York		
University of Rochester School of Medicine.....(1933) N. B. M. Ex.		
(1934), (1935), (1936) New York		
Duke University School of Medicine.....(1937) N. B. M. Ex.		
Eclectic Medical College, Cincinnati.....(1938, 4)		
Ohio State University College of Medicine.....(1937)		
Hahnemann Medical College and Hospital of Philadelphia.....(1937), (1938, 3) Penna., (1938, 5)	Maryland	
Jefferson Medical College of Philadelphia (1917), (1924), (1925), (1936, 2) Pennsylvania, (1930) N. B. M. Ex., (1934) Ohio, (1918), (1937), (1938) New York		
Temple University School of Medicine (1927), (1928), (1930), (1934), (1935) Pennsylvania, (1938) North Carolina		
University of Pennsylvania School of Medicine.....(1918) New York		
(1918), (1935) Pennsylvania, (1925) N. B. M. Ex., (1937) North Carolina		
University of Pittsburgh School of Medicine.....(1936)		
Woman's Medical College of Pennsylvania.....(1937)	Tennessee	
University of Tennessee College of Medicine.....(1937)	Texas	
University of Texas School of Medicine.....(1935)	Virginia	
University of Vermont College of Medicine.....(1938)		
Medical College of Virginia.....(1929) N. B. M. Ex.		
University of Virginia Department of Medicine.....(1931)	New York	
Dalhousie University Faculty of Medicine.....(1931)		

- Queen's University Faculty of Medicine.....(1932) W. Virginia
University of Toronto Faculty of Medicine.....(1936) New York
McGill University Faculty of Medicine.....(1935) N. B. M. Ex.
University of Montreal Faculty of Medicine.....(1928) Mass.
Medizinische Fakultät der Universität Wien (1910), (1923),
(1927), (1932) New York
Friedrich-Wilhelms-Universität Medizinische Fakultät,
Berlin(1899), (1932)* New York, (1931) Maryland
Julius-Maximilians-Universität Medizinische Fakultät,
Würzburg(1925) Iowa
Kaiser-Wilhelms-Universität Medizinische Fakultät,
Strassburg(1906) New York
Ludwigs-Maximilians-Universität Medizinische Fakul-
tät, München(1898), (1914), (1936) New York
National University of Athens School of Medicine....(1892) Mass.
Magyar Királyi Erzsébet Tudományegyetem Orvostudo-
mányi. Pecs(1928) New York
Regia Università di Napoli Facoltà di Medicina e Chir-
urgia(1891) Penna.
Regia Università degli Studi di Roma. Facoltà di
Medicina e Chirurgia(1935) Maine
Uniwersytet Stefana Batorego Wydział Lekarski, Wilno (1936) New York
Licentiate of the Royal College of Physicians, of the
Royal College of Surgeons of Edinburgh and of the
Royal Faculty of Physicians and Surgeons of Glas-
gow(1936) N. B. M. Ex., (1935), (1938, 3) New York
Universität Bern Medizinische Fakultät....(1935), (1936, 2) New York
* License has not been issued.

Book Notices

Diverticula and Diverticulitis of the Intestine: Their Pathology, Diagnosis, and Treatment. By Harold C. Edwards, M.S., F.R.C.S., Surgeon and Lecturer in Surgery to King's College Hospital, London. With foreword by Gordon Gordon-Taylor, O.B.E., M.S., F.R.C.S. Cloth. Price, \$8. Pp. 335, with 223 illustrations. Baltimore: William Wood & Company, 1939.

This constitutes an achievement in writing, in original observation and in scientific manner of description. It is in substance the Jacksonian Prize Essay of the Royal College of Surgeons for the year 1932, revised and brought down to date. It reminds one of the rare and comprehensive theses de Paris of earlier years, in which a subject was approached with an original point of view, expanded and propounded and exhaustively portrayed. The author, a surgeon of ability and experience, has the capacity of combining an abundant understanding of the physiology of the bowel with a good sense of pathology. In addition, his medical point of view is at all times one of common sense and good judgment, devoid of fixed opinions, flexible and open, which, combined with surgical experience, makes for a rounded whole.

As regards the etiology of intestinal diverticula, the author leans heavily on the acquired rather than the congenital origin. One wonders whether this aspect is not at times overplayed and the congenital phase, particularly as regards the duodenum, not sufficiently stressed. Throughout, the developmental weakness of the bowel at the point of entrance of the vessel, plus the pulsion force of increased intraluminal pressure, explain all diverticula with but few exceptions. Thus the combination of pathology with the most recent physiologic advances explains the phenomena of diverticulosis, to the neglect of the congenital factors. The chapter on Meckel's diverticulum is excellent; peptic ulceration within the diverticulum is admirably described. It is noticeable that the radiographic description of peptic ulcer in Meckel's diverticulum is not mentioned. One might disagree with the inclusion of duodenal diverticula in the first portion of the duodenum as a consequence of ulcer at this site. These outpouchings of the lateral walls as a result of continuous ulcer spasm so rarely develop into anything resembling true diverticula that they constitute points of pathologic interest rather than diverticula of clinical significance. The chapters on the recurrence and formation of diverticula of the jejunum and ileum are lucid and clear. The illustrations and particularly the colored plates are so well executed and the text is so direct that one reads with interest and understands clearly what might otherwise be a difficult subject. The roentgenograms here as well as throughout the book are excellently reproduced, as are the photomicrographs of the intestinal wall.

In diverticulosis of the colon, the author expresses a definite preference for the barium sulfate enema over the barium sulfate

meal for its demonstration. One can agree heartily with this choice. The use of "dual exposure" pictures is advocated and logically expounded. This method is probably unfamiliar to American readers and deserves attention. In fact, the entire chapter on radiography of colonic diverticula calls for close reading, as it is replete with original thought and observation. It is a relief finally to read that carcinoma of the colon and diverticulosis are not pathologically associated but are merely coexistent and unrelated. This is today the more recent view and should help finally to lay the ghost of carcinoma ex diverticula. The approach to the treatment of diverticulitis is moderate and conservative. The use of lavage and irrigation is reasonable, accepted and advocated. Nowhere is the abrupt surgical attack pushed and overstated. When surgery is advocated, it is well described as regards both indications and actual surgical technic; moderation and limited procedures rather than overmeddlesome resections are employed.

A good readable text, unusually good illustrations, references widely distributed in world literature, always ample but never overabundant so as to constitute a nuisance, a modern physiologic point of view and a remarkably balanced and controlled judgment on medical and surgical therapy make this volume one of interest and of great value.

Human Helminthology: A Manual for Physicians, Sanitarians and Medical Zoölogists. By Ernest Carroll Faust, A.B., M.A., Ph.D., Professor of Parasitology and Director of Laboratories, Department of Tropical Medicine, Tulane University of Louisiana, New Orleans, Louisiana. Second edition. Cloth. Price, \$8.50. Pp. 780, with 302 illustrations. Philadelphia: Lea & Febiger, 1939.

New data in biologic and clinical lines published since the appearance of the first edition in 1929 have been incorporated in all important chapters and an entirely new chapter on anthelmintics and their use has been added. This supplemental material has added 164 pages to an already extensive work. The new chapter will greatly enhance the usefulness of the work for physicians, since it critically summarizes the existing clinical evaluations of santonin, oil of chenopodium, thymol, carbon tetrachloride, tetrachlorethylene, hexylresorcinol (caprokol), beta-naphthol, medicinal gentian violet, pelletierin, *Dryopteris filix-mas*, areca, kousso, pumpkin seed, kamala, quassia, coconut, antimony compounds and emetine hydrochloride. In each case the nature of the drug is given and its use, its effectiveness as an anthelmintic, dosages, administration, toxicity and uses as a specific for various helminths are reported in detail. Contraindications for each important drug are reported. Accurate diagnosis of the helminth infection is stressed and specific therapy recommended for the reason that, although a single anthelmintic may be effective against several species of parasites, nevertheless there is no one drug useful as a general anthelmintic and rarely is any one equally efficient against even two different species.

This manual is a mine of information in an oft neglected field and is an indispensable addition to the library of every biologist and physician.

Medizinische Praxis: Sammlung für ärztliche Fortbildung. Herausgegeben von Prof. Dr. L. R. Grote, Direktor der Medizinischen Klinik des Rudolf-Hess-Krankenhauses Dresden, Prof. Dr. A. Fromme, Direktor der Chirurgischen Abteilung des Stadtkrankenhauses Dresden-Friedrichstadt, Prof. Dr. K. Warnekros, Direktor der Staatlichen Frauenklinik zu Dresden, und Prof. Dr. F. Lange, Direktor der Medizinischen Klinik des Stadtkrankenhauses Dresden-Friedrichstadt. Band XXVIII: Die Faeces des Menschen: Funktionelle Diagnostik der Darmkrankheiten, Physiologie und Pathophysiologie der Verdauungsvorgänge. Von Professor Dr. med. W. Heupke, Oberarzt der Medizin. Univ. Poliklinik Frankfurt a. M. Paper. Price, 9 marks. Pp. 115, with 59 illustrations. Dresden & Leipzig: Theodor Steinkopf, 1939.

This monograph contains fifty-five black and white illustrations and four colored plates, the former representing organisms found in the feces of human beings and methods of study of them, the latter the appearance of substances observed in stools of individuals suffering from various digestive disturbances. The purpose of the book is said to be a gathering of information for use in actual medical practice. It is emphasized that it is required of a physician that he present the best of his knowledge to the people of his own country. The book has ten chapters. Chapter 1 concerns itself with a discussion of digestion in various intestinal segments. In chapter 11 the

general character of a stool study is discussed with emphasis on the ova of worms, occult blood and methods of examination. A macroscopic study of stools is detailed in chapter III. Emphasis is laid on weight, mixture, consistency, form and color of stools and the presence of mucus, pus and food residue. The technic of examination is described. Most emphasis is extended to the microscopic study of stools and the longest chapter, chapter IV, is devoted to this subject. Technic of study is explained, microscopic reactions are described and substances to be looked for are enumerated and described. These substances, according to the author, include muscle and elastic fibers, fats, starch, cellulose, crystals, mucus, leukocytes, erythrocytes, epithelial debris and other food residue. Chapter V is devoted to the diagnosis of maladies caused by worms, with ample illustrations. In chapter VI a bacteriologic study of stools is detailed. Reference is made particularly to the bacterial flora present in non-disease states. It is said that from one fourth to one third of the dry matter of stools consists of bacteria and that the average adult person casts off eighty-five billion bacteria daily. Chapter VII is devoted to the study of protozoa. Only five pages, including nine illustrations, is devoted to this. Chemical analysis of the stool is described in chapter VIII. The significance of acid and alkaline reactions is discussed and analysis for occult blood, bile, albumin and ferments is outlined. Chapter IX is devoted to a discussion of quantitative analysis of stools for fat and other food residue. In chapter X the significance of the aforementioned studies is described as it relates to various disease processes: sprue, pancreatic disease, various types of dyspepsia, enterocolitis and nervous diarrhea. One short paragraph is devoted to the conditions found in the presence of cancer. The author's discussion of the material at hand is excellent. As an aid to actual medical practice the book seems to fall short in its failure to report valuable knowledge of bacteria and other constituents of discharges of the bowels in inflammatory disease processes and in its failure to add to existing knowledge.

Biological Oxidation. By Carl Oppenheimer, M.D., Ph.D., and Kurt G. Stern, Ph.D. With the collaboration of W. Roman, Ph.D. Cloth. Price, \$8.25. Pp. 317, with 17 illustrations. New York: Nordemann Publishing Company, Inc.; The Hague: Dr. W. Junk, 1939.

This volume represents an amplification of the chapter on biologic oxidations in Oppenheimer's more general work on enzymes. There has been a need for a comprehensive theoretical treatment of this subject and the volume under review meets a part of that need. The historical method of development of the subject is used, which leads to some confusion in presentation. Some confusion results from developing the subject in terms of the Wieland-Warburg argument. That controversy is now a matter of history and a straightforward presentation of theory with supporting facts would be more intelligible to the serious beginning student. On the whole, however, the theory is presented in fundamental terms and can be followed by any one who has a moderately good background in modern physical chemistry. The book is written as a guide for beginning investigators in the field and as a critical digest of existing information for others. There are 1,383 references to the significant literature. Typographical and grammatical errors are regrettably numerous, sometimes as many as two to a page. "Octet" is consistently misspelled.

Go Down, Death! A Story of Facts and Figures. By M. C. Igloe, M.D., Director of the Mecosta-Oscoda Health Department, Big Rapids, Michigan. Paper. Pp. 46. Big Rapids, Michigan, 1939.

This mimeographed spiral-bound document is an interesting effort to do for the health officer's annual report of Mecosta-Oscoda counties, Mich., what Robert Benchley did for the "Treasurer's Report, and Other Forms of Community Singing." Dr. Igloe, with a sure sense of what will make people read things they ought to read but usually will not, starts out with a list of persons important to public health work in his territory, the state of Michigan, and the nation. Then he proceeds to beguile his readers with titles which tell little but promise much. "Robert Manton Makes a Discovery" is the heading of chapter I, dealing with the discovery by a citizen that a health department exists in the community and that it can do something about

typhoid. "They Were Once Considered Stupid" introduces the subject of health examinations of school children, and the necessary corrections, appropriately assigned to the family doctor. "You're Twenty-Five Years Too Late" tells about expectant mothers and what modern medicine, with the cooperation of health departments, can do for them. "Swell, Then I Don't Have to Marry the Girl" is the approach to the syphilis problem and premarital examination. "Thank God for Lipstick" tells about restaurant sanitation, dish washing and inspection. "Scarcely Anybody Ever Died" is aimed at the arguments of the old timers who think that public health work is an unnecessary frill and a needless expense. "Trials and Tribulations" is a lament about the small share contributed locally for local public health work, plus some timely remarks on the obligations of health departments to be as local as possible and to let medical treatment alone. "Haves vs. Have-Nots" is neither political nor economic but epidemiologic and serologic, treating of persons with communicable diseases, carriers, immunes, contacts and epidemics. "A Collector of Garbage Cans" is the all too realistic discussion of infected mouths and decaying teeth. "Go-Down, Death," the last and titular chapter, named from a Negro spiritual quoted from "God's Trombones" by James Weldon Johnson (Viking Press, 1927) is a summary and conclusion, with appropriate references to two health awards earned by the two-county health department in the rural contests by the Chamber of Commerce of the United States. Practical souls who must have their statistics will find them, succinctly and graphically presented, in the appendix, where the casual reader can take them or let them alone. After reading the rest of the report, it is more likely that he will take them. This is a refreshing and interesting example of how annual reports, which are too often dull and dreary obligations, can actually be made stimulating and entertaining.

Ätiologie und Pathogenese der Ekzemkrankheiten: Klinische Studien über die Ursachen der Ekzeme unter besonderer Berücksichtigung des diagnostischen Wertes der Ekzempriben. Von Poul Bonnevie, Dr. med., Oberarzt der Hautklinik des Finsensinstituts zu Kopenhagen. Paper. Price, 18 marks. Pp. 392, with 65 illustrations. Kopenhagen: NYT Nordisk Forlag Arnold Busek; Leipzig: Johann Ambrosius Barth, 1939.

This excellent work is a clinical study of the cause of eczema, with especial consideration of the diagnostic value of the tests in eczema, and was done with the view of throwing light on therapy, prophylaxis and medical opinion as it pertains to insurance matters in eczema. The author, who is chief of the skin clinic of the Finsen Institute at Copenhagen and an expert on public works and factory inspection, states that this motive was the special basis of his investigation, as well as his experience, which on the whole coincides with the studies of others on the knowledge of those cases of eczema which are associated with idiosyncrasy and in which definite proof of allergy is demonstrated. He further states that after securing positive diagnostic tests it is necessary to prove their value in eczema. The author outlines his material as (1) the eczema group (restriction and separation of the eczema group; description and types of eczema); (2) idiosyncratic eczema (primary epidermal irritability); (3) mycotic eczema (known as trichophyids; epidermophyids); (4) constitutional prurigo eczema, and (5) pathogenetic of eczema (primary cutaneous anaphylaxis eczema). The material was collected for the purpose of bringing greater clarity to the problem of the etiology and pathogenesis of the customary cutaneous diseases that are grouped under the name eczema. The author feels that as a result of his observations there is possibly a historical isolation of other disease pictures that have been previously included under eczema and in which idiosyncratic phenomena assume a more or less special role. The clinical idea of idiosyncrasy has in recent years been bound together with general pathologic and immunobiologic processes and has therefore found a place in studies on allergy. A critical evaluation of this view as well as a consideration and evaluation of the eczematous diseases on the same basic theories naturally fits in the scope of this treatise and the whole subject is discussed in a profound manner, making the book a difficult one to review. This work will find a desirable place in the library of those interested in the problem of eczema from the allergic or cutaneous point of view.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Chiropractic Practice Acts: Amendment of Complaint in Revocation Proceedings; Unprofessional Conduct Defined.—A licensed chiropractor was convicted on an information charging her with "six unrelated petit larcenies." The Supreme Court of Colorado reversed the conviction on the ground that the information charged the commission of several different crimes. Thereafter the board of chiropractic examiners revoked the chiropractor's license, the proceedings being based on the commission of two of the six larcenies that were involved in the criminal case. The district court upheld the board and the chiropractor appealed to the Supreme Court of Colorado.

The Colorado board of chiropractic examiners may suspend or revoke a license for, among other causes, the conviction of a crime involving moral turpitude or for "unprofessional, dishonorable or immoral conduct." Charges must be presented to the board under oath; the accused must be furnished with a copy of the charges at least thirty days before the hearing, and the accused must be given a chance to be heard. The original complaint in this case charged the commission of the two petit larcenies. At the hearing, after the complaint was assailed as insufficient, the board permitted an assistant attorney general to amend the complaint by adding an allegation that in the commission of the acts charged the chiropractor was guilty of unprofessional, dishonorable and immoral conduct. Thereafter the license was revoked. The complaint, as originally filed, obviously did not set forth any of the grounds for which a license may be revoked or suspended. The chiropractic act specifies that the conviction, not the commission, of certain offenses shall be ground for discipline. When the board permitted the assistant attorney general to amend the complaint at the hearing, the court said, it manifestly attempted to validate a defective complaint by using language that presented another ground not theretofore mentioned. Furthermore, the only duty of the attorney general, under the chiropractic act, was "to advise the board upon all legal matters and to represent the board in all actions brought by or against it." He was in no sense the complainant or prosecutor and did not ex officio supplant the one who filed charges. The amendment was not supported by the required oath, either of the original complainant or of anybody else. The board therefore had no right to consider it in the hearing.

Even if the board had jurisdiction, continued the Supreme Court, the revocation order could not be sustained. The complaint did not charge any unprofessional, dishonorable or immoral conduct within the meaning of the act. The commission of the two misdemeanors on which the complaint was based had no connection with the practice of chiropractic and therefore constituted no ground for disciplinary action. The "unprofessional, dishonorable or immoral conduct" referred to in the act would include such practices as malpractice, false representation by public advertisement or otherwise of inevitable cure by chiropractic, gross personal immorality clearly objectionable in common social or professional intercourse, or misrepresentations or misdeeds directly connected with the practice of chiropractic.

The criminal prosecution of the chiropractor failed because it constituted an attempt to join six alleged offenses entirely independent of one another. The board subsequently undertook to function as a substitute tribunal by entertaining a complaint that had the same weaknesses as the criminal information. If such an omnibus proceeding, the court observed, is an unwholesome deviation from recognized procedure in the regular course of criminal jurisdiction, then all the more is it to be avoided when the hearing is before a lay tribunal. While the board undertook to try the chiropractor on only two of the original six charges of petit larceny, it admitted evidence of all six charges. This was clearly improper and erroneous.

Finally, said the court, the board imposed on the chiropractor the extreme penalty, namely, the revocation of her license, thus depriving her of her means of livelihood. Had she been lawfully convicted in the criminal case of the two larcenies involved in the revocation proceeding, the maximum penalty would have

been imprisonment in the county jail for not more than sixty days and/or a fine of not more than \$100. Yet the board undertook to deprive her of her life profession. Such severity constituted, in the opinion of the court, an abuse of discretion.

The Supreme Court therefore directed the lower court to command the board to restore the chiropractor's license.—*Hummel v. Board of Chiropractic Examiners of Colorado (Colo.)*, 87 P. (2d) 248.

Malpractice: Chiropractic Treatment of Hemorrhoids.—The defendant Mims was a licensed chiropractor in LaGrange, Ga., although, the plaintiff charged, he professed to practice surgery and to administer medicine and held himself out to the public as a doctor. Mims advertised to remove hemorrhoids in a painless, bloodless and drugless manner, and when the plaintiff applied to him for treatment he guaranteed a cure. According to the plaintiff's complaint, however, Mims did not treat him in a painless, bloodless and drugless manner but made injections of a medicine of some kind with a hypodermic needle and performed a cutting operation with an unsterilized safety razor blade, without exercising reasonable care and skill to prevent infection. Hemorrhages followed the operation and the plaintiff was forced to call in a physician. The plaintiff suffered intense pain, he claimed, because of Mims' failure to exercise a reasonable degree of care and skill in performing the operation, and abscesses developed because Mims did not use properly sterilized instruments, and the plaintiff was, he claimed, permanently and totally disabled for work at any hard labor. In the city court of LaGrange judgment was rendered for the plaintiff. The defendant chiropractor thereupon moved for a new trial, and when his motion was overruled he appealed to the court of appeals of Georgia, division No. 2.

There was testimony, said the court of appeals, that the defendant used an unsterilized safety razor blade in operating on the plaintiff and that he gave the plaintiff a number of injections. Although these charges were denied by the defendant, the evidence was sufficient, said the court, to authorize the verdict. The defendant, contended, however, that it was error for the trial court to charge the jury, in accordance with the Georgia Code, section 84-924, that:

A person professing to practice surgery or the administering of medicines for compensation must bring to the exercise of his profession a reasonable degree of care and skill. Any injury resulting from a want of such care and skill shall be a tort for which a recovery may be had.

The standard set by the code, the defendant contended, does not apply to a chiropractor, as the evidence showed that chiropractors do not administer medicine or perform surgical operations. A chiropractor would be liable, the defendant contended, only for failure to apply the degree of care and skill required by the established practice of chiropractors. In a case in which a chiropractor confined himself within the limits of his profession, said the court of appeals, this objection might be meritorious, but it could not be said that it was error to give this instruction in a case in which there was testimony to the effect that the chiropractor had exceeded those limits by administering an injection or a number of injections and by performing a surgical operation with a safety razor blade. Moreover, the trial court charged that a person within the purview of the section of the code quoted must exercise such a reasonable degree of care and skill as under similar conditions and like surrounding circumstances is ordinarily employed by a person engaged in the same general line of practice. The charge given by the trial court was not error.

The defendant complained that the trial court failed to charge the jury (1) that it could not set up a standard of its own as to what constituted ordinary care, (2) that it must be guided solely by the testimony of those engaged in chiropractic practice and (3) that if it was unable to determine from the testimony of chiropractors what constituted ordinary care and skill there would be a failure of proof as to the only standard on which the jury could rely, and the evidence would be insufficient to sustain the plaintiff's case. Such a proposed charge, said the court of appeals, was not good law. The jury is always the judge of what constitutes ordinary care and what constitutes negligence, and they are not confined to chiropractic testimony in determining the question. There might be a custom or course

of practice among chiropractors which medical experts would condemn, and certainly such evidence could not be excluded from consideration by the jury.

The judgment of the court below was affirmed.—*Mims v. Ragland (Ga.)*, 2 S. E. (2d) 174.

Hospitals: Liability When Profits Are Devoted to Charitable Purposes.—The plaintiff, a woman over 70 years of age, was admitted to the defendant hospital as a pay patient. Several days after her admission she fell out of bed, and one of the attending physicians gave instructions that the bed be equipped with a side board. This precautionary procedure was hereafter utilized except on one occasion, at which time the plaintiff again fell out of bed and fractured her right hip. She sued the hospital and obtained a judgment in the trial court from which the hospital appealed to the district court of appeal, first district, division 1, California, contending that it was a charitable institution and as such exempt from liability.

The evidence showed that the defendant hospital was built from private funds secured through a loan. It received no endowments or donations and its income was derived solely from patients. There were no stockholders and its officers served without remuneration. It accepted charity, semicharity and full pay patients. A free clinic for children and expectant mothers was maintained, and a free school for training nurses was operated. It gave "dole at its doors," free meals to indigent applicants and assistance to poor families outside of the hospital. The articles of incorporation provided that "Pecuniary profit is not and never shall be the object of this corporation," but in the paragraph outlining the purpose of the corporation no mention was made of charity. The trial court found that the hospital "was operated by said defendant for profit even though the general purposes of said defendant may have been charitable."

In California, said the district court of appeal, the rule is well settled that where one accepts the benefit of a public or of a private charity he impliedly exempts the benefactor from liability or the negligence of servants in administering the charity. The reason for the rule is public policy. If the organization and the method of operation are strictly non-profitable, and the fundamental purpose is charity, the public is best served by the rule that exempts from liability the proceeds from donations and trust funds that aim to aid the sick and afflicted, who would be unable otherwise to obtain the advanced scientific care and treatment. Where a charity hospital is operated at a loss, the court continued, and the deficit is met by resort to the proceeds of trust funds and donations, the law, in the interest of protecting the many as against the few, assumes that entry into such an institution constitutes a waiver by the patient of rights for damages resulting from injuries occurring from the negligence of its servants when due care has been used in the selection of the servants. If the hospital is not dependent on gifts and donations for its usual upkeep, the waiver does not apply unless the patient is the recipient of charitable benefits, in which instance it would be against sound morals to sue the benefactor. The court noted a distinction between torts of charitable institutions committed in the direct administration of the charity and torts committed in deriving funds wherewith to operate the charity. In the latter instance, the court said, the hospital is liable.

In the present case, the court continued, a loan was negotiated for the construction of the hospital, and it was maintained from profits derived from the operation of the pay-patient department. The hospital was not endowed but created its own funds for charity. There was, therefore, no possibility of a trust fund, donated as charity for many of the sick and afflicted, being diverted or depleted by an award of damages to one person. The defendant hospital was a good business enterprise, the court thought. The primary purpose of it was profit, even though that profit was devoted to charity. When the plaintiff was admitted to the hospital she was ignorant of any claim that it was exempt from liability for its negligence on the theory that it was a charitable institution. She was charged full rates for care, pharmaceutical supplies and all services rendered. Except in the one instance of negligence, she received all the advantages and all the benefits given to any patient who might have paid full rates in any hospital not claiming charitable exemption. Considering all the facts of the case, the court could find no

justification for exempting the defendant hospital from the liability incurred by other hospitals conducted for profit.

The judgment in favor of the plaintiff was therefore affirmed.—*Silva v. Providence Hospital of Oakland (Calif.)*, 87 P. (2d) 374.

Society Proceedings

COMING MEETINGS

- Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.
- Alabama, Medical Association of the State of, Birmingham, Apr. 14-15. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Association for the Study of Goiter, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane Pa., Secretary.
- American Association for the Study of Neoplastic Diseases, Louisville, Ky., Apr. 11-13. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.
- American Association on Mental Deficiency, Atlantic City, May 22-23. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American Laryngological Association, Rye, N. Y., May 27-29. Dr. C. J. Imperatori, 108 East 38th St., New York, Secretary.
- American Orthopedic Association, Kansas City, Mo., May 6-9. Dr. Ralph K. Gormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Otolological Society, Rye, N. Y., May 30-31. Dr. Isidore Friesner, 36 East 73d St., New York, Secretary Pro-Tem.
- American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
- American Psychiatric Association, New York, May 1-3. Dr. Arthur H. Ruggles, 305 Blackstone Bldg., New York, Secretary.
- American Society for Clinical Investigation, New York, May 1-3. Dr. Eugene M. Landis, 340C E. 12th St., New York, Secretary.
- American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.
- American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixer, 319 N. 3rd St., St. Louis, Secretary.
- Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 E. 1st St., Tucson, Secretary.
- Arkansas Medical Association, Little Rock, Apr. 15-17. Dr. W. R. Brookshire, 602 Garrison St., Little Rock, Secretary.
- Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
- California Medical Association, Coronado, May 6-9. Dr. George H. Kest, 450 Sutter St., San Francisco, Secretary.
- Connecticut State Medical Society, Hartford, May 22-23. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
- Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
- Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Illinois State Medical Society, Peoria, May 21-23. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.
- Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
- Kansas Medical Society, Wichita, May 15-16. Mr. Clarence G. Munro, 112 West Sixth St., Topeka, Executive Secretary.
- Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical Association of, Baltimore, Apr. 23-24. Dr. Richard D. Richardson, 1000 North Ave., Baltimore, Secretary.
- Massachusetts Medical Association, Boston, May 21-22. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
- Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.
- Mississippi State Medical Association, Jackson, May 14-16. Dr. T. H. Dye, McWilliams Bldg., Clarksdale, Secretary.
- Missouri State Medical Association, St. Louis, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 1000 N. 1st St., St. Louis, Executive Secretary.
- Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. E. Adams, 416 Fe, Lincoln, Secretary.
- New Hampshire Medical Society, Manchester, May 14-15. Dr. Carlton R. Metcalf, 5 South State St., Concord, Secretary.
- New Mexico Medical Society, Albuquerque, May 27-29. Dr. L. E. Cohenour, 219 West Central Ave., Albuquerque, Secretary.
- New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
- New York State Association of Public Health Laboratories, Rochester, May 20. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- North Carolina, Medical Society of the State of, Pinehurst, May 13-15. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.
- North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Skelsey, 20 1/2 North Broadway, Fargo, Secretary.
- Northern Tri-State Medical Association, Battle Creek, Mich., Apr. 5-7. Dr. E. Benjamin Gillette, 320 Michigan St., Toledo, Ohio, Secretary.
- Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. S. Nelson, 29 East State St., Columbus, Executive Secretary.
- Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Wilcox, 210 Plaza Court Bldg., Oklahoma City, Secretary.
- Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. E. A. Hines, Seneca, Secretary.
- South Dakota State Medical Association, Watertown, May 22-23. Dr. Clarence E. Sherwood, Madison, Secretary.
- Tennessee State Medical Association, Chattanooga, Apr. 9-11. Dr. H. H. Shoulters, 706 Church St., Nashville, Secretary.
- Texas, State Medical Association of, Dallas, May 13-16. Dr. H. H. Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

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- Diffuse Meningiomas. L. M. Weinberger, Philadelphia.—p. 1.
Extragenital Chorionepithelioma: Report of Case. L. Berman, Minneapolis.—p. 23.
Observations on Injection of Human Wart (Verruca Vulgaris) Extracts into Rabbits with Benzpyrene Papillomas on Ear. A. Brunschwig, D. Tschetter and Anna Hamann, Chicago.—p. 50.
Retroperitoneal Fibrosarcoma: Report of Eight Cases. W. L. McNamara, H. D. Smith and C. S. Boswell, Los Angeles.—p. 63.
*Primary Fibromyoma of Breast: Report of Case and Review of Literature. R. J. Lebowich and G. Lenz, Gloversville, N. Y.—p. 73.
Does Cholesterol Stimulate Tumor Development? C. A. Baumann, H. P. Rusch, B. E. Kline and H. P. Jacobi, Madison, Wis.—p. 76.
Chemotherapy in Experimental Cancer: I. Attempts to Produce Intratumoral Clotting by Combined Action of Lead and Thrombogenic Agents. W. A. Selle, F. Paquin and P. Brindley, Galveston, Texas.—p. 86.
*Crude Wheat Germ Oil as Factor of Tumor Formation in Rats. L. L. Ginzton and C. L. Connor, San Francisco.—p. 90.
Lipid Composition of Intracranial Tumors. L. O. Randall, Rochester, N. Y.—p. 92.
Determination of Serum "Acid" Phosphatase Activity in Differentiating Skeletal Metastases Secondary to Prostatic Carcinoma from Paget's Disease of Bone. A. B. Gutman, Ethel Benedict Gutman and J. N. Robinson, New York.—p. 103.
Rabbit Test for Malignancy. J. Gershon-Cohen, M. Samson and H. Shay, Philadelphia.—p. 109.

Primary Fibromyoma of Breast.—Lebowich and Lenz report, in a woman aged 58, the fourth case of fibromyoma of the breast arising from the parenchyma and independently of the nipple. Like other fibromyomas of this type, the tumor was painless in contrast to those originating in the nipple. The origin of the growth could not be determined with certainty. From the morphology of the tumor cells and their products, the number of mitotic figures and the absence of tissue infiltration or invasion of blood vessels and lymphatics the tumor is considered benign.

Wheat Germ Oil and Tumor Formation.—Ginzton and Connor found no tumors in two groups of rats fed crude wheat germ oil in large amounts over a period of ten months, nor did they observe any tumors produced in ten rats fed a diet the bulk of which consisted of wheat germ. Vitamin E and vitamin B complex, which are abundant in wheat germ oil and wheat germ respectively, apparently produce no changes in rats when fed in excessive amounts.

American Journal of Physiology, Baltimore

128: 417-628 (Feb.) 1940. Partial Index

- Effects of Formalin on Hormones of Human Pregnancy Urine. L. Loeb and S. J. Hayward, St. Louis.—p. 425.
Pulmonary Arterial Pressure in Experimental Renal Hypertension. L. N. Katz and F. S. Steinitz, Chicago.—p. 433.
Thymus-Adrenal Relationship. A. Segaloff and W. O. Nelson, Detroit.—p. 475.
Method for Simultaneous Recording of Focal Cerebral Blood Flow, Hydrogen Ion Concentration, Electrical Activity and Blood Pressure. H. Jasper and A. Cipriani, Montreal.—p. 488.
Effect of Heat on Gonadotropic Pituitary Antagonist. H. Jensen, Sibylle Tolksdorf and J. F. Grattan, New Brunswick, N. J.—p. 532.
Validity of Electrical Doublet Theory of Cardiac Action Current. R. Ashman, W. S. Wilde and Catherine E. Drawe, New Orleans.—p. 547.
Relationship of Anterior Pituitary and Adrenal Cortex in Metabolism of Carbohydrate. Jane A. Russell, New Haven, Conn.—p. 552.
Radioactive Iodine as Indicator in Thyroid Physiology: Iodine Collection by Normal and Hyperplastic Thyroids in Rabbits. S. Hertz, A. Roberts, J. H. Means and R. D. Evans, Boston.—p. 565.
Relationship Between Adrenal and Parathyroid Glands. C. M. Blumenfeld and F. W. Clausen, Salt Lake City.—p. 577.
Amount of Ascorbic Acid Excreted at Each Urination During Twenty-Four Hour Periods. Jessie E. Richardson and Helen L. Mayfield, Bozeman, Mont.—p. 583.
Sympathetic Action in Accommodation for Far Vision. M. W. Morgan Jr., J. M. D. Olmsted and W. G. Watrous, Berkeley, Calif.—p. 588.

American Review of Tuberculosis, New York

41: 143-282 (Feb.) 1940

- *Thoracoplasty in Older Patients. R. H. Overholt, Brookline, Mass.—p. 143.
Extrapleural Pneumothorax and Oleothorax: Their Management. J. R. Paxton, A. S. Churchill and Jane Skillen, Olive View, Calif.—p. 163.
*Rate of Conversion of Sputum During Pneumothorax Treatment. R. A. Bendove, H. Alexander, M. D. Deren and S. Lipstein, New York.—p. 177.
Tuberculosis in the Negro: Clinical and Roentgenologic Characteristics. H. L. Israel and H. M. Payne, Philadelphia.—p. 188.
*Tuberculosis in the Aged: Statistical Study. E. R. Wiese, White Haven, Pa.—p. 210.
Tuberculosis of Spine: Clinical Study of 203 Patients from Sea View and St. Luke's Hospital. M. Cleveland, New York.—p. 215.
Tuberculosis Control: Interpreting Its Modern Methods to the Public from the Official Point of View. H. F. Vaughan, Detroit.—p. 232.
Id.: Interpreting Its Modern Methods to the Public from the Nonofficial Point of View. Katherine Z. W. Whipple, New York.—p. 237.
Federal and State Programs of Vocational Rehabilitation. T. Copp, Washington, D. C.—p. 246.
Tuberculosis Studies in Tennessee: Results Obtained from Serial Examinations of Sputum. R. L. Gauld and W. C. Williams, Nashville, Tenn.—p. 257.

Thoracoplasty in Older Patients.—Overholt feels that on theoretical grounds many older tuberculous patients should respond favorably to permanent collapse of the diseased portion of the lung. The author gives the results of thoracoplasty obtained with 162 consecutive tuberculous patients between 40 and 65 years of age. The operations were performed between November 1931 and May 1939. The 162 patients represent 24 per cent of all patients treated by thoracoplasty within this period. Patients with bilateral involvement and with serious complications, such as fever, progression of infiltrative lesions, empyema, extrapleural tuberculosis and nontuberculous complications (heart disease, diabetes) were operated on. Extensive destruction of pulmonary tissue has left the older patient with uninvolved portions of lung too small in volume to fill the thorax. A carefully graded and selective thoracoplasty reduces the volume of the thoracic cage so that its volume is not excessive for the remaining healthy portion of lung. The alteration in the position of the thoracic wall not only permits relaxation of fibrous tissue and cavity closure but in many cases readjusts the position of the remaining healthy portion of the lung and the heart so that their function is improved. The operative and early mortality (within the first three months) rate in this series was 6.8 per cent. The late mortality, due to tuberculous disease, was 4 per cent. Permanent collapse benefited 84 per cent of cases followed from six to ninety months. Fifty-two of the patients returned to work. The positive sputums of 87 per cent of the patients were converted. The operation was supplemented by lung mobilization in ninety-nine patients, the average number of stages was 2.1, thirty-one patients required but one operation and partial thoracoplasty; seven ribs or less was sufficient for ninety-seven patients. Patients who have reached the later decades of life should not be denied the benefits of permanent collapse therapy on the grounds of age alone.

Conversion of Sputum During Pneumothorax Treatment.—Bendove and his associates determined the time interval between therapeutic pneumothorax and the conversion of positive sputum. The study is based on the observations of 546 of 1,320 Sea View Hospital patients whose sputums became negative, and of 165 of 275 private patients. The patients of the last group were confined to bed in a hospital or at home for only the first few treatments; all subsequent insufflations were continued while the patients were ambulatory. Only those cases which were persistently negative for six months are included in the study. The rate of conversion of sputum by months after the induction of pneumothorax shows that the highest number of cases become negative in the early months of the treatment. From the fourth month on there is a steady decline with few sputums being converted after the ninth month. More than 90 per cent turn negative within the first six months of treatment. No definite relation was established between the side of the lesion and maximal conversion, although all left-sided cases yield a slightly higher percentage of conversion (10) within the first three months of treatment. When the duration of the illness prior to pneumothorax is six months or less, the chances of the sputum becoming negative within the first three months is good (80 per cent). A longer dura-

tion of illness before pneumothorax therapy shows no definite correlation with the interval of sputum conversion. Low intrapleural pressures are just as effective as high pressures in suppressing tubercle bacilli in the sputum. The anatomic extent of unilateral lesions appears to have little relation to the rate of sputum conversion after pneumothorax is instituted. The most direct relation was established between age and maximal conversion. Other things being equal, the younger the patient the sooner does his sputum become negative after pneumothorax therapy. More than 70 per cent of the sputums of patients from 16 to 25 years of age became converted within the first three months and almost all of them became negative within six months of treatment. A reverse ratio is observed in the older persons. These ratios can be used as a reliable index as to the time limit of effectiveness of pneumothorax when the advisability of other measures of collapse therapy is considered.

Tuberculosis in the Aged.—In his study of tuberculosis in the aged, Wiese states that of 100 men fifty-nine had positive sputums and of thirty-five women the sputums of eighteen were positive. These 135 patients 60 or more years of age were ill from three weeks to 366 months before admission, the average being 41.6 months. Of the seventy-seven positive patients, sixty-four were either married or widowed. It is impossible to estimate what damage they have done in the way of spreading tuberculosis among a generation younger than themselves. That, to the author, is the all important question to be considered. He hopes that the generally accepted opinion that all elderly persons must cough and that such coughing is without danger will soon be changed and that all elderly persons with a chronic cough, with or without sputum, will be subjected to as rigorous an examination as a younger person. Geriatrics is a rapidly developing branch of medicine; it is reasonable to assume that in the near future one of its major problems, at least from a prophylactic point of view, will be tuberculosis in the aged.

Archives of Surgery, Chicago

40: 161-372 (Feb.) 1940

- Conservative Treatment of Occlusive Arterial Disease. I. Wright, New York.—p. 163.
- Thrombo-Angiitis Obliterans: Treatment with Sodium Tetrathionate and Sodium Thiosulfate. F. V. Theis and M. R. Freeland, Chicago.—p. 190.
- Therapy of Phlebothrombosis and Thrombophlebitis. A. Ochsner and M. DeBakey, New Orleans.—p. 208.
- Lymphedema of Limbs. J. Homans, Boston.—p. 232.
- Amputation for Peripheral Vascular Disease. G. de Takáts and J. T. Reynolds, Chicago.—p. 253.
- Periarteritis Nodosa Simulating an Acute Abdominal Condition Requiring Operation. P. D. Allen, New York.—p. 271.
- *Peripheral Vasospasm from Tobacco. C. A. Moyer and W. G. Maddock, Ann Arbor, Mich.—p. 277.
- Surgical Intervention on Sympathetic Nervous System for Peripheral Vascular Disease. R. H. Smithwick, Boston.—p. 286.
- Heparin in Surgical Treatment of Blood Vessels. G. Murray, Toronto.—p. 307.
- Influence of Temperature on Development of Gangrene in Peripheral Vascular Disease. N. E. Freeman, Philadelphia.—p. 326.
- *Effect of Estrogens on Vascular Spasm Due to Active Angiitis in Extremities. L. G. Herrmann and E. J. McGrath, Cincinnati.—p. 334.
- Speed of Blood Flow in Arteries and in Veins of Man. W. F. Kvale, L. A. Smith and E. V. Allen, Rochester, Minn.—p. 344.
- Diabetic Gangrene: Review of 972 Cases of Gangrene Associated with Diabetes Mellitus Treated at the New England Deaconess Hospital. L. S. McKittrick, Boston.—p. 352.
- Recent Advances in Anesthesia—1939. R. C. Adams, Rochester, Minn.—p. 364.

Peripheral Vasospasm from Tobacco.—Moyer and Maddock declare that tobacco, regardless of its form or the manner in which it is used, produces peripheral vasospasm. It has been indicted as the inciting cause of thrombo-angiitis obliterans without actual proof. As to its effect on the course of the disease, it is general knowledge that continued smoking is associated with progressive circulatory deficiency in spite of the application of all known medical aids. Silbert has not seen a recurrence of the disease once it had been arrested by treatment unless the patient resumed smoking. The manner in which tobacco induces the pathologic process, if it actually is able to do so, is not known. No parallelism has been established between hypersensitiveness to tobacco extracts and the degree of vascular response to smoking. The question whether sensitization to tobacco is the prime factor in the causation of thrombo-angiitis

obliterans is still open. The possibility that chronic vasospasm incident to the use of tobacco for long periods may in itself be a highly important etiologically has likewise been neither proved nor disproved. However, drugs unallied in structure to nicotine are capable of producing peripheral gangrene; thus it is conceivable that nicotine may occasionally do likewise. It is also possible that chronic vasospasm may simply be a strong contributing factor to the pathologic process which is maintained by some to be due to specific endarteritis. This may well represent the actual role of tobacco in the causation of thrombo-angiitis obliterans. Whether or not an actual causal relation between tobacco and thrombo-angiitis obliterans can be established, it is absolutely essential to abstain from tobacco, as the primary aim in the treatment of any acute peripheral vascular deficiency is to maintain a sufficient blood flow to support metabolic processes in the diseased member. Any drug as active as nicotine in producing a decreased blood flow in the extremities must be absolutely avoided, or treatment is useless. One might well say "Your legs or your cigarettes" and refuse to treat any patient with thrombo-angiitis obliterans who continues to smoke. Patent filters and denicotinized cigarettes must likewise be prohibited, as proof exists that these processes are not adequate to prevent the vasospasm associated with smoking.

Effect of Estrogens on Vascular Spasm.—Herrmann and McGrath, in the treatment of sixteen patients with arterial insufficiency due to secondary vasomotor instability associated with active arteritis or phlebitis, used moderate quantities of estrogen parenterally (estrone, or theelin) at regular intervals for at least sixteen weeks. The final evaluation of the patient's condition was based on objective studies of the efficiency of the peripheral vascular system and on an analysis of the patient's account of the effects on the signs and symptoms of the disease of a variety of environmental conditions. Pain was pronounced in twelve of the patients and they were given moderately large amounts (50 mg. intravenously each day for five days) of thiamin chloride in addition to the estrogenic substances. Eleven of the sixteen patients have been so improved that they were able to return to their work. Either the vasomotor instability completely disappeared or the disease process remained so quiescent that it caused no great disability or concern. Pain in the digits showed equal improvement. Vascular studies of these patients showed a more nearly normal vascular response under natural environmental conditions and in a constant temperature room. Three patients had a recrudescence of the signs and symptoms after two years of relief, but the activity of the process again subsided, although less completely, after another course of treatment with estrogen. The symptoms of four of the remaining patients have remained unchanged after many months of observation and the symptoms of the last patient continued to grow worse in spite of all therapeutic effort.

California and Western Medicine, San Francisco

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- Combined Nitrous Oxide-Oxygen Local Anesthesia. R. K. Gilman, San Francisco.—p. 56.
- Recent Advances in Treatment of Hematemesis and Melena. G. H. Lanphere, Los Angeles.—p. 59.
- Chronic Nonhealing Lesions of Nose. R. Fletcher, San Francisco.—p. 62.
- Immunity: Clinical and Experimental Observations. H. E. Tishler, San Francisco.—p. 64.
- *Idiopathic Ulcerative Colitis: Effectiveness of Liver Extract in Treatment. G. Cheney, San Francisco.—p. 66.
- Epidermophytosis of Hands and Feet: Its Treatment. H. E. Allen, San Francisco.—p. 68.
- Hyperemesis Gravidarum. A. Bernstein, San Francisco.—p. 69.
- Ruptured Membranes Prior to Onset of Labor. R. D. McElroy, Los Angeles.—p. 72.

Liver Extract for Idiopathic Ulcerative Colitis.—Cheney used liver extract parenterally in the treatment of twenty-five cases of idiopathic ulcerative colitis. From 10 to 20 U. S. P. units of the extract was injected three times a week for the first two weeks and then twice a week thereafter until a complete remission ensued. Maintenance therapy was essential to maintain good health. An injection of 20 U. S. P. units every one to three weeks was usually sufficient, but the necessary dose of liver extract varied with the individual patient. Signs of improvement, such as diminution of the diarrhea, formed stools, increase in appetite and gain in weight, were usually noticeable by the third week of treatment. There was

no correlation between the severity of the disease and the time of response. Besides the injection of liver extract a high calory, low residual diet, camphorated tincture of opium symptomatically and bed rest for the acutely ill patient was prescribed. Occasionally a vegetable muceloid or kaolin was given to solidify the stools during the early course of treatment. Rectal instillations were avoided. Patients who do not do well on liver extract therapy must be carefully scrutinized to detect any factors which are acting as a barrier to their recovery, as liver extract therapy alone may be ineffective. These factors are likely to be one or more of the following: The diagnosis may be incorrect. There may be contributory factors to the infection. Allergy and nervous system instability may be of such importance as to nullify any beneficial effect of the liver extract. The extent of the destructive process in the intestinal wall must be considered and the choice of liver extract may have an important bearing on the outcome of treatment. Until recently the author used a highly concentrated liver extract. Highly concentrated applies only to the antianemic substance, fraction G, and in liver extract so concentrated practically all of the vitamin B₁ and B₂ are eliminated. It is not only probable that any substance effective in the treatment of ulcerative colitis may also be lost in the concentration process, but the administration of an unconcentrated liver solution parenterally to four patients recently indicates that it may be more effective than the concentrate. It was given intramuscularly in a dose of 5 cc. two or three times a week, representing only 5 U. S. P. units (antianemic) per dose.

Endocrinology, Los Angeles

26: 189-368 (Feb.) 1940. Partial Index

- Studies on Mechanism of Diabetic Disturbance Using "Nitrogen Minimum Excretion" as Measure of Glyconeogenesis. S. J. Thannhauser, Boston.—p. 189.
- Oral Use of Pregneninonol in Functional Menorrhagia. E. C. Hamblen, N. B. Powell, W. K. Cuyler and C. J. Pattee, Durham, N. C.—p. 201.
- Comparison of Different Preparations of Amorphous and Zinc Crystalline Insulin. F. M. Allen, New York.—p. 208.
- *Masked Hypothyroidism Having Abdominal Symptoms: Three Cases. A. Bassler, New York.—p. 218.
- Medical Treatment of Hyperthyroidism. W. Redisch, New York, and W. H. Perloff, Philadelphia.—p. 221.
- Acromegaly Studied During Course of Disease and at Autopsy: Case. G. Flaum and Elaine P. Ralli, New York.—p. 229.
- Inhibition of Lactation Post Partum with Testosterone Propionate. J. S. Beilly and S. Solomon, New York.—p. 236.
- *Muscle Strength in Myotonia Atrophica (Dystrophia Myotonica) Improved by Testosterone Propionate. F. H. Hesser, O. R. Langworthy, Baltimore, and S. A. Vest, Charlottesville, Va.—p. 241.
- Further Studies on Purification of Mare Gonadotropic Hormone. H. Goss and H. H. Cole, Davis, Calif.—p. 244.
- Further Studies on Relation of Thyroid and Hypophysis to Ovarian Responses of Menopause Urine Extracts. S. L. Leonard and J. De Frates, New Brunswick, N. J.—p. 255.
- Mode of Action of Testosterone Propionate on Female Genital Tract. J. W. Huffman and L. H. Bos, Chicago.—p. 259.
- Androgenic Action of Desoxycorticosterone. C. W. Hooker and V. J. Collins, New Haven, Conn.—p. 269.

Masked Hypothyroidism with Abdominal Symptoms.—Bassler presents the cases of three women with hypothyroidism masked by gastrointestinal disturbances. The symptoms have no regularity. Modifications of the classic symptoms seen in distinct myxedema appear in most of the cases. They are not striking and often escape detection. The symptoms helpful in the diagnosis of masked hypothyroid states are pain in the abdomen, pallor and dry skin, blood pressure never above normal and usually below, a tendency to subnormal temperature, mental depressions and poor memory, sparseness or absence of pubic hair and retarded development of the genitalia, low basal metabolic rates and leukopenia with generally a high relative lymphocyte count. The author's patients were dramatically and rapidly benefited by thyroid therapy. Why there was abdominal pain and tenderness is not understood. It may have been neurogenic in origin; it certainly was not due to colonic stasis or constipation.

Muscle Strength in Atrophic Myotonia Improved by Testosterone Propionate.—Two men with atrophic myotonia and testicular atrophy were treated by Hesser and his associates with 25 mg. of testosterone propionate intramuscularly every other day for more than two months. Quinine was taken daily. The dynamometric response of the finger flexors was recorded graphically to note strength (single maximal contraction), total work and maximal flexion rate before and during treatment.

Other subjective and objective changes accompanying treatment were carefully observed. Within the week of the first injection the grip became stronger rapidly, reached a peak within the next two weeks and leveled subsequently at the higher base line. Temporary withdrawal of the drug from one patient resulted in decreased dynamometric values four days after the last injection. Both patients were gratified with the outcome of treatment, especially the sense of greatly increased strength and the general constitutional improvement. Buoyancy of spirit, feeling of well being and lessened fatigability were observed. Posture and gait improved noticeably. A weight gain of some 15 pounds (6.8 Kg.) occurred; this might have been due to hydration or actual muscle dimension changes (hypertrophy). Frequency of micturition correlated with previous observations on bladder musculature. Recurrent priapism with increased sex urge became evident. A third male patient given androgen without quinine showed no change in myotonia. Another man with moderately advanced progressive muscular dystrophy but no gonadal changes was treated with testosterone propionate without demonstrable dynamometric response. How androgenic hormone influences muscle activity is unexplained. It is responsible for the greater muscular development and capacity of the adult male and certainly its inadequacy accounts for the well known muscle alterations in male castrates. The effect seems a predominantly mechanical one. Its ability to cause electrolyte, nitrogen and water retention in these individuals indicates that testosterone undoubtedly acts as a metabolic synergist in much the same manner as adrenal cortical substance. When the two patients were deprived of treatment the condition reverted, in a month, to its original status. The authors state that the effect of androgen probably is a nonspecific one and one that would occur in any castrate. However, to be more certain of the specificity and mode of action of testosterone propionate in atrophic myotonia they are continuing the treatment of these and other patients.

Journal of Experimental Medicine, New York

71: 129-282 (Feb.) 1940. Partial Index

- Significance of Synovial Villus and Ciliary Process as Factors in Localization of Bacteria in Joints and Eyes of Rabbits. D. M. Angevine and S. Rothbard, New York.—p. 129.
- Characteristics of Strain of Lymphocytic Choriomeningitis Virus Encountered as Contaminant in Tissue Cultures of Rabies Virus. J. Casals-Ariet and L. T. Webster, New York.—p. 147.
- *Symptomatic Herpes, Sequela of Artificially Induced Fever: Incidence and Clinical Aspects, Recovery of Virus from Herpetic Vesicles and Comparison with Known Strain of Herpes Virus. S. L. Warren, C. M. Carpenter and Ruth A. Boak, Rochester, N. Y.—p. 155.
- Thermal Inactivation Time at 41.5 C. of Three Strains of Herpes Simplex Virus. Ruth A. Boak, C. M. Carpenter and S. L. Warren, Rochester, N. Y.—p. 169.
- Studies on Experimental Hypertension: XI. Effect of Excision of Carotid Sinuses on Experimental Hypertension Produced by Renal Ischemia. H. Goldblatt, J. R. Kahn, F. Bayless and M. A. Simon, Cleveland.—p. 175.
- *Toxoplasmic Encephalomyelitis: IV. Experimental Transmission of Infection to Animals from a Human Infant. A. Wolf, D. Cowen and Beryl H. Paige, New York.—p. 187.
- Presence in Syphilitic Serum of Antibodies to Spirochetes, Their Relation to So-Called Wassermann Reagin and Their Significance for Serodiagnosis of Syphilis. H. Eagle and R. B. Hogan, Washington, D. C.—p. 215.

Herpes After Artificially Induced Fever.—Warren and his colleagues observed herpes in 190 of the 411 patients subjected to artificial hyperpyrexia for the treatment of acute or chronic gonococcal infection, chronic infectious arthritis, advanced syphilis of the central nervous system, multiple sclerosis, asthma and malignant tumors. Only seven of 131 had a second, but less severe, attack with a subsequent treatment; therefore 183 of the patients acquired some immunity to the disease. No correlation could be found between the occurrence of the herpes and the hyperpyrexia method, duration or height of the fever, suggesting that the elevation of temperature rather than the disease provides the stimulus for the development of herpes. The cases of herpes usually appeared in series. At times there were no cases for from ten to thirty days; at other times, for a week or longer, herpes developed in almost every patient subjected to the therapy. The simultaneous appearance of encephalitis-like symptoms with extensive herpetic facial lesions after induced fever suggests that the herpes and the "encephalitis" were due to the same causative agent. The course and type of the disease was similar in almost every instance. Because of this the lesions from eight patients were examined for the presence of a filter-

passing virus. Four of the six strains of virus recovered from these herpetic lesions were identified further by investigating their immunologic relationship to a known strain of herpes virus (Frank strain) by means of cross immunization of rabbits. The plan was to immunize the rabbits to each of the unknown strains and test them for immunity to the Frank strain and likewise to immunize animals to the Frank strain and test their immunity to each of the recently recovered strains. Three rabbits immunized to the strains of herpes virus, Mu, St and Ra respectively, showed no signs or symptoms of encephalitis after intracerebral injection of 0.1 cc. of a 10 per cent brain suspension of the Frank strain. Two of them, under observation for six months, at no time showed any evidence of the disease. The third died after twenty-one days from trauma incurred while the rectal temperature was being taken. No evidence of herpes was revealed at necropsy. One rabbit injected with the Bo strain of herpes virus died of typical encephalitis ten days after the Frank strain was administered. The two animals which had recovered from encephalitis during the course of animal passage of strain St and Bo survived inoculation of the Frank strain. The two control rabbits injected only with the Frank strain of herpes virus died in three and five days, respectively, with characteristic symptoms of herpes encephalitis. Of the five rabbits in which attempts were made to induce immunity to the Frank strain, only one survived the entire course of inoculation. This animal when injected with strain Bo intracerebrally died within four days. In two other animals encephalitis developed during the course of immunization, which terminated in death. The recovery from herpetic vesicles from fever-treated patients indicates that the disease accompanying artificially induced fever is similar to herpes simplex resulting from acute infectious diseases.

Experimental Transmission of Toxoplasmic Encephalomyelitis.—Wolf and his co-workers encountered a case of granulomatous encephalomyelitis due to a protozoan. They transmitted the infection to three rabbits and six infant mice and identified the causative micro-organism as a *Toxoplasma*. The authors state that a parasite identical with that in the lesions of the human case was found in the lesions of the experimental animals. The morphology of this micro-organism, the course of the disease and the lesions produced in the animals inoculated with it, the wide host range of this parasite and the results of cross-immunity experiments establish its identity as a *Toxoplasma*. It is suggested that the micro-organism be designated *Toxoplasma hominis*. The infection in the infant is the first proved instance of human toxoplasmosis. Since the lesions were confined to the central nervous system the disease is termed toxoplasmic encephalomyelitis. This records the first experimental transmission of human toxoplasmosis to animals.

Journal Industrial Hygiene & Toxicology, Baltimore

22: 53-88 (Feb.) 1940

- *Comparative Physiologic Effects of Pure, Commercial and Crude Benzenes. H. H. Schrenk, W. P. Yant, S. J. Pearce, Pittsburgh, and R. R. Sayers, Washington, D. C.—p. 53.
- *Silicosis and Type III Pneumococcus Pneumonia: Experimental Study. A. J. Vorwald, A. B. Delahant and M. Dworski, Saranac Lake, N. Y.—p. 64.
- Acute Vapor Toxicity of Allyl Chloride. E. M. Adams, H. C. Spencer and D. D. Irish, Midland, Mich.—p. 79.

Effects of Pure, Commercial and Crude Benzenes.—From experimental tests to determine the comparative physiologic effects of pure, commercial and crude benzenes, Schrenk and his associates find that crude benzene produced the least physiologic action. Pure and commercial benzenes had about the same physiologic effect, the latter producing a slightly greater effect on dogs and the former a somewhat greater effect on guinea pigs. The physiologic response to pure and crude benzenes was much the same. The response of the animals was characteristic of benzene poisoning, and the physiologic effect apparently was due primarily to the benzene content of the benzenes and not to impurities.

Silicosis and Type III Pneumococcus Pneumonia.—The unusual susceptibility of the silicotic lung to tuberculosis has led to the inference that such lungs may also be more vulnerable to pneumonia. To check the validity of this supposition,

Vorwald and his colleagues carried out certain studies with the following results: 1. The addition of silica, either in particulate or in dispersed colloidal form, to a blood-broth culture medium had no influence on the growth or the morphology of type III pneumococci. 2. Silicotic rabbits showed no unusual susceptibility to type III pneumococcus infections produced by intracutaneous injection, by inhalation or by intrabronchial instillation. 3. Type III pneumococcus pneumonia, produced experimentally in rabbits with advanced silicosis, ran a normal course, showed no tendency to organize and resolved as completely as in normal control rabbits. 4. Silicotic nodules were remarkably resistant to the action of pneumococci and retained without modification the distinctive characteristics of such lesions in rabbits. 5. The presence of silicosis had no influence on the well defined immune reactions to type III pneumococci that can be elicited in normal rabbits. Their natural resistance to avirulent and virulent strains was maintained and acquired resistance, conferred by previous infection, was apparently as well developed as in nonsilicotic control animals. 6. If the length of life is taken as an index of resistance, the observations suggested that if anything the presence of silicosis might actually enhance the resistance of the rabbit to type III pneumococcus infection.

Missouri State Medical Assn. Journal, St. Louis

37: 41-92 (Feb.) 1940

- Present Status of Therapy with Sulfanilamide and Sulfapyridine. A. F. Hartmann, H. L. Barnett, Anne M. Perley and Mary E. Ruhoff, St. Louis.—p. 41.
- Pneumonia in Childhood. W. M. Whitaker, Quincy, Ill.—p. 54.
- Treatment of Depression and Melancholia. G. W. Robinson Jr., Kansas City.—p. 65.

New England Journal of Medicine, Boston

222: 167-204 (Feb. 1) 1940

- Bone Lesions Accompanying Cervical Spinal Cord Injuries: End Result Study of Seventy-Six Cases. D. Munro and W. Wegner, Boston.—p. 167.
- *Acute Abdominal Conditions Following Ovulation and Its Sequelae. D. J. McSweeney and F. O. Wood, Boston.—p. 174.
- Estimation of Nutritional State in Children. M. M. Glazier, Boston.—p. 180.
- "Common Colds." N. C. Turner, Arlington, Mass.—p. 184.
- Gynecology: Pelvic Pain and Its Relief. J. V. Meigs, Boston.—p. 187.

Acute Abdominal Conditions Following Ovulation.—McSweeney and Wood direct attention to the fact that a ruptured graafian follicle, a bleeding corpus luteum, a ruptured corpus haemorrhagicum and a corpus haemorrhagicum cyst with or without rupture are conditions frequently overlooked in the differential diagnosis of acute lower abdominal pain in women. Ovulation may cause pain in several ways: by rupture of the graafian follicle when the ovum is being extruded—the so-called "mittelschmerz" (midperiod pain), after the ovum has been expelled and the blood escapes through failure of the stigma to become sealed off. Later in the cycle there may be pain due to rupture of the corpus haemorrhagicum or to the formation of a corpus haemorrhagicum cyst, which may cause pain of itself or by its rupture. A study of the records at the Boston City Hospital showed that, from 1926 through 1933, 257 patients were admitted with a chief complaint of abdominal pain due to ovulation or its sequels. Of these, 216 were operated on. Three types of cases were differentiated. There were seventy-four cases, including fifteen which were discharged without operation, which could be considered as cases of ruptured graafian follicle. The fifty-nine cases in which operation was performed were characterized by absence of free blood in the peritoneal cavity and by evidence of recent ovulation. In this group nothing was done surgically to the ovaries. There were 165 cases of ruptured corpus haemorrhagicum, in 139 of which operation was performed. The latter showed evidence of free blood in the pelvis. The cases were treated by a mattress suture. In the third category there were eighteen cases of corpus haemorrhagicum cyst, of which thirteen had ruptured. Resection was done in all the cases of this group. The authors studied the relative incidence of acute appendicitis and pain due to ovulation during two typical years and found that there was one case with pain from ovulation to every thirteen of appendicitis. In order to determine how frequently ovulation may cause abdominal discomfort not sufficiently severe to demand medical aid, the authors questioned for a month at

gynecologic patients who had normal menstrual regularity and found that twenty-one of 134 patients, or about one in six, frequently had abdominal pain of a minor degree midway between periods and that fifty-three of 134 patients (40 per cent) had some symptoms suggesting ovulation. Appendicitis and pain consequent to ovulatory phenomena may exist simultaneously. In cases in which the differentiation is not positive, a midline incision instead of a right rectus or McBurney's is suggested in order to simplify the exploration of the pelvis.

New York State Journal of Medicine, New York

40: 153-234 (Feb. 1) 1940

- Primary Ileocecal Tuberculosis. B. B. Crohn and H. Yarnis, New York.—p. 158.
- Treatment of Operable Rectal Cancer. G. E. Binkley, New York.—p. 167.
- Acute Abdominal Conditions. R. F. Barber, Brooklyn.—p. 173.
- Serologic Tests as Aids in Diagnosis and Prognosis of Syphilis. A. B. Wadsworth, Albany.—p. 177.
- Role of Endocrines in Dermatology. J. J. Eller and L. H. Kest, New York.—p. 182.
- Sparing Effect in Poliomyelitis. G. Dalldorf, Valhalla.—p. 187.
- Immobilization of Chest in Pleurisy and Rib Fracture. H. J. Christensen, Poughkeepsie.—p. 191.
- Obstetrics in a General Hospital: Ten Thousand Cases at the Bronx Hospital. J. I. Kushner, New York.—p. 194.
- Late Irradiation Reaction in Bladder Wall Following Use of Radium in Uterine Disease. C. C. Herger and A. A. Thibaudreau, Buffalo.—p. 199.
- Effect and Toxic Effect of Sulfapyridine in Old Age Pneumonia. P. Kaufman, New York.—p. 204.
- Management of Complications Arising During Cyclopropane Anesthesia. H. R. Griffith, Montreal.—p. 209.

Rocky Mountain Medical Journal, Denver

37: 73-160 (Feb.) 1940

- *Early Diagnosis and Treatment of Cervical Cancer. H. E. Schmitz, Chicago.—p. 90.
- Should Quiescent Adenomatous Goiters Be Removed? N. F. Hicken, Salt Lake City.—p. 94.
- Trimalleolar Fracture of Ankle with Backward Displacement of Foot. R. G. Packard, Denver.—p. 100.
- Obstetric and Gynecologic Complications Caused by Anterior Lip of Cervix. J. W. Sugden, Salt Lake City.—p. 103.
- The Doctor and the Nurse at Work. J. Erwin, Denver.—p. 106.
- Method for Quantitative Estimation of Sulfanilamide and Sulfapyridine in Blood and Urine. W. W. Williams, Denver.—p. 110.
- Relation of Capillary and Corneal Osmosis to Glaucoma Therapy. W. H. Luedde, St. Louis.—p. 112.
- Medical Photographic Technic. D. D. Long, Denver.—p. 113.
- Treatment of Arthritis: Physiologic Approach. R. W. Kullberg and L. M. Lowell, Astoria, Ore.—p. 114.

Early Diagnosis and Treatment of Cervical Cancer.—Schmitz states that, since 1932, 1,104 cases of carcinoma have been admitted to the gynecologic tumor clinic of the Cook County Hospital. The diagnosis in each instance has been made or confirmed by biopsy. In a previous series of cases genital carcinoma was found to comprise 27 per cent of cancer in the female subject, and 79.61 per cent of the genital group occurred in the cervix. As 75 per cent of the present series were far advanced when first seen, it can be readily appreciated how markedly the end results could be improved were the cases diagnosed while in the early stage, which has a curability of from 80 to 100 per cent. Magnification of lesions by means of the colposcope is of definite value in bringing about more careful study of the cervix. He describes the Schiller iodine test and advocates it as an aid in picking the site for biopsy. Biopsy is the most valuable aid in diagnosing early cancer. There is no proof that the procedure is injurious. Whether alteration in cellular morphology is sufficient to diagnose cancer is questionable. Invasion plus atypia is definitely so. The author considers irradiation as the method of choice in the treatment of cervical cancer, surgery having a slightly inferior salvage rate and a much higher mortality rate. Moreover, about 12 per cent of inoperable cases are amenable to radiation therapy. General emaciation and cachexia, and anemia as well as impaired nitrogen metabolism, are contraindications to radiation.

South Carolina Medical Assn. Journal, Greenville

36: 1-32 (Jan.) 1940

- Shall We Be Leading Pioneers or Driven Slaves? C. B. Epps, Sumter.—p. 1.
- State Medicine, Affirmative (Advantages). W. G. Bishop, Greenwood.—p. 6.
- Birth Registration in South Carolina. H. L. Dunn, Washington, D. C.—p. 14.

Southern Medical Journal, Birmingham, Ala.

33: 123-228 (Feb.) 1940. Partial Index

- Parathyroid Osteosis: Report of Severe Case with Successful Removal of Large Parathyroid Tumor. J. Vance, J. Rogde and L. W. Breck, El Paso, Texas.—p. 128.
- Radiation Therapy in Carcinoma of Fundus of Uterus. C. L. Martin, Dallas, Texas.—p. 135.
- Analysis of Intracutaneous Tests on 309 Patients for Lymphogranuloma Venereum and Chancroid. H. M. Robinson, Baltimore.—p. 144.
- *Effect of Pregnant Mare's Serum Hormone on the Abnormal Ovary. L. A. Gray, Louisville, Ky.—p. 160.
- Status of Retrobulbar Neuritis in Paranasal Sinus Disease. J. B. Costen, St. Louis.—p. 170.
- Surgery of Biliary Tract. A. S. Jackson, Madison, Wis.—p. 177.
- Considerations in Evaluating the Therapy of Hay Fever. C. H. Eyer-mann, St. Louis.—p. 190.
- *Routine Tuberculin Patch Testing in Infancy. L. Bivings, Atlanta, Ga.—p. 194.
- Recent Studies of Epidemic Diarrhea and Dysentery. E. L. Stebbins, Albany, N. Y.—p. 197.
- Maintenance of Health Among Railway Employees. J. W. Davis, Statesville, N. C.—p. 203.
- Sulfapyridine in Pneumonia. V. E. Schulze, San Angelo, Texas.—p. 209.
- Toxic Effects of Sulfanilamide. G. J. Levy, Memphis, Tenn.—p. 212.
- Common Errors in Diagnosis and Treatment of Anemias. P. A. Tuckwiller, Charleston, W. Va.—p. 216.

Pregnant Mare's Serum Hormone and Abnormal Ovaries.—Gray studied the effect of pregnant mare's serum hormone in the form of "gonadogen" on the endometrium of thirty-three women with abnormal ovarian secretion. Of eleven women complaining of amenorrhea, treated from one to sixteen months, eight menstruated, seven regularly or fairly so. A gradually developing premenstrual secretory endometrium was observed in at least four, two were apparently refractory and two women were insufficiently treated. Of seven women with endometrial hyperplasia associated with metrorrhagia, a secretory endometrium was obtained by one middle aged woman. Only one of the six younger patients was clinically regulated. Of seven women having interval nonsecretory endometria and metrorrhagia, slight secretion developed in three and a normal premenstrual endometrium in one. Only two were clinically cured. Two patients with secretory endometrium and metrorrhagia were not improved. Six women, all with minor metrorrhagia but one in which no biopsies were taken, were improved or cured. The pregnant mare's serum hormone will apparently often stimulate the abnormal ovary when there is subnormal stimulation, as in amenorrhea and oligomenorrhea. It is possibly of value in metrorrhagia when the uterus is small.

Routine Tuberculin Patch Testing in Infancy.—Bivings believes that tuberculin patch testing of all infants reaching 1 year of age would uncover many heretofore unsuspected sources of tuberculous infection, such as in nurses, especially Negro. It should not be regarded as final evidence when negative but should be followed by 0.1 mg. of old tuberculin intracutaneously in suspected cases. Because of its simplicity and safety and lack of pain it would make an excellent substitute for the primary test in all cases.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

48: 63-128 (Feb.) 1940

- Biologic Characteristics of Equine Gonadotropic Hormone. C. F. Fluhmann, San Francisco.—p. 63.
- The Gynecologist and the Law. C. W. Page, Berkeley, Calif.—p. 75.
- Some Legal Aspects of Obstetrics. H. C. Alward, Los Angeles.—p. 84.
- Artificial Cross Insemination. G. S. Beardsley, Eugene, Ore.—p. 94.
- Hip Arthroplasty, with Vitallium Cap. K. Speed, Chicago.—p. 101.
- Nose Defects, Partial: New Modification of the "French" Method of Restoration with Sliding Flaps of Adjoining Tissue. E. D. Twyman, Kansas City, Mo.—p. 106.
- Sulfodiethylsuccinate and Maleic Acid Mixture in Clinical Contraception. H. C. Mack and R. S. Siddall, Detroit.—p. 110.
- Surgical Approach to Hypertension: Division XI. F. M. Findlay, San Diego, Calif.—p. 118.

West Virginia Medical Journal, Charleston

36: 49-96 (Feb.) 1940

- Occlusive Peripheral Vascular Emergencies. E. J. C. Hildenbrand, Washington, D. C.—p. 49.
- Significance of Oxygen to Surgical Patient. D. E. Brace, New York.—p. 57.
- Cardiac Aneurysm. G. S. Hartley, Clifton Forge, Va.—p. 64.
- Advanced Pneumoconiosis with Pulmonary Artery Thrombosis. J. L. Wade, Parkersburg.—p. 69.
- Edgar Allan Poe (Psychiatric Case Study). E. F. Reaser, Huntington.—p. 73.
- Glaucoma. T. W. Moore, Huntington.—p. 80.
- Problems Relating to Indigent and Low Income Medical Cases in West Virginia. D. A. MacGregor, Wheeling.—p. 84.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

- 1: 79-116 (Jan. 20) 1940
Investigations and Observations on Inoculation Technic. J. W. Bigger, J. W. S. Blacklock and H. J. Parish.—p. 79.
Nasal Sinusitis in Children. D. Guthrie.—p. 84.
Childbirth After Presacral Neurectomy. T. V. Pearce.—p. 87.
Sulphapyridine in Treatment of Acute Urethritis. N. S. Taylor.—p. 88.
Results of Treatment of Gonorrhea with Sulphapyridine: Further Observations. E. E. Prebble.—p. 89.
1: 117-158 (Jan. 27) 1940
Gonorrheal Myocarditis. O. Bang.—p. 117.
Prevention of Anxiety. R. G. Gordon.—p. 120.
Management of Respiratory Depression During Anesthesia. F. B. Mallinson.—p. 123.
Value of Inbred Mice in Relation to General Study of Mammary Cancer. Georgiana M. Bonser.—p. 125.
Quintuplets: Record of Premature Delivery. R. K. Rau, A. A. Aiyar and T. V. Mathew.—p. 127.

Gonorrheal Myocarditis.—According to Bang, apart from the myocardial involvement in septic endocarditis, myocarditis is seldom established as a complication of gonococcal infection. Gonococcal infection is never mentioned in the current textbooks on heart diseases as a possible cause of myocarditis, though almost every other common infectious disease is recognized as such. Six cases of gonorrheal myocarditis were encountered within one year in an ordinary medical ward. This, the author believes, may mean that the condition, escaping detection since it is not searched for, is more common than ordinarily believed. The diagnosis in the six cases was made on the ground that all of them had changes in the electrocardiogram occurring in the course of acute or chronic complicated gonococcal infection. In some instances the myocarditis was slight and transitory. In two cases incomplete bundle branch block developed and persisted, and in a third case the anginal pain still troubled the patient considerably when he was reexamined a year later. Such a course suggests the possibility that some of these patients will return to the hospital sooner or later with chronic heart disease. It is possible also that some of the chronic "degenerative" heart diseases seen today may arise from a gonococcal infection. The gonococcus complement fixation reaction has been instrumental in pointing out how many so-called rheumatic arthritis cases were really gonorrheal. It may be worth while to search the anamnesis of heart patients for gonorrhea, as the complement fixation reaction may reveal that some instances of cardiac lesions attributed to rheumatic infection ought to be regarded as following persistent gonococcal infection.

Journal of Laryngology and Otology, London

- 55: 1-74 (Jan.) 1940
Anatomy of Salpingopharyngeus Muscle. J. K. McMyn.—p. 1.

Journal of Pathology and Bacteriology, Edinburgh

- 50: 1-200 (Jan.) 1940. Partial Index
*Carbohydrate Metabolism and Staphylococcal Infection in Rabbits. S. H. Jackson, T. F. Nicholson and W. L. Holman.—p. 1.
Effects Produced by Toxic and Nontoxic Extracts of Haemophilus Pertussis and Brucella Bronchiseptica on Blood Sugar of Rabbits. J. G. Oddy and D. G. Evans.—p. 11.
Histology of Catarrhal Bronchitis and Collapse of Lung in Mice Infected with Influenza Virus. M. Straub.—p. 31.
Immunity and Antibody to Influenza in Mice. C. L. Oakley and G. Harriet Warrack.—p. 37.
Occurrence of Intracellular Inclusions in Cultures of Fetal Leptomeninges. Catherine F. Fischmann and Dorothy S. Russell.—p. 53.
Congenital Diverticulum of Left Ventricle of Heart in Case of Epiloia. R. M. Norman and A. L. Taylor.—p. 61.
Observations on Bacteriostatic Action of Sulfanilamide and Sulphapyridine and on Influence Thereon of Bacteria and Peptone. A. Fleming.—p. 69.
Effect of Desensitization of Tuberculous Guinea Pigs. G. S. Wilson, Herta Schwalbacher and Irene Maier.—p. 89.
Adaptation in Veins to Increased Intravenous Pressure, with Special Reference to Portal System and Inferior Vena Cava. P. L. Li.—p. 121.

Carbohydrate Metabolism and Staphylococcal Infection.—Jackson and his associates observed the effect of experimental staphylococcal infections on carbohydrate metabolism in normal rabbits and in rabbits in which a certain degree of intolerance for dextrose had been produced. The results indicate that the effect of a staphylococcal lesion in rabbits on their

carbohydrate metabolism bears a direct relation to the degree to which the lesion is localized. When the lesion is poorly localized so that a spreading necrotic area results, the infection lowers the ability of the organism to metabolize dextrose in both types of rabbits. However, if the lesion is well localized with a small area of necrosis and a local accumulation of free pus, the effect of the infection is, if anything, the reverse. It seems possible from clinical reports that these observations can be extended to man in a general way. Consistent disturbances in carbohydrate metabolism in cases of large, inflamed, pustular areas of infection and in indurated acne have been reported. The lack of consistency in reported clinical observations can be explained in part by the divergent effects of these two general types of staphylococcal lesions. The observation that a high carbohydrate diet will tend to localize better the infection agrees with the results of Tauber, who gave dextrose intravenously to a number of patients with furunculosis and obtained remarkably good results. These effects on carbohydrate metabolism appear to be related to the elaboration and absorption of toxin or other bacterial products from the infected areas. Toxin injections in both normal and high carbohydrate-dieted animals result in a necrotic area and a decrease in tolerance for dextrose. This is not alone an effect of necrosis, as a similar necrosis induced by burns or turpentine was without effect. The only difference between the staphylococcal lesion in normal rabbits and the turpentine lesion was the absence from the latter of bacteria and hence of bacterial products. Yet the former lesion produced a decreased dextrose tolerance while the latter had no effect.

Journal of Physiology, Cambridge

- 97: 273-432 (Jan.) 1940. Partial Index
Vascular Reactions of Cat After Total Sympathectomy. G. L. Brown and W. d'A. Maycock.—p. 273.
Sympathomimetic Action of Local Anesthetics. J. Tripod.—p. 289.
Primary Acidity of Gastric Juice. T. Teorell.—p. 308.
Production of Exophthalmos in Dog by Acetylcholine. C. E. Brunton.—p. 383.
Effects of Increased Metabolism on Ketosis of Depancreatized Dog. S. B. Barker.—p. 394.
Disappearance from Blood of Intravenously Injected Insulin. H. K. Goadby and J. S. Richardson.—p. 417.

Lancet, London

- 1: 157-204 (Jan. 27) 1940
Future of Clinical Teaching. J. A. Ryle.—p. 157.
*Testosterone Propionate and Vasomotor Phenomena of Gonadal Deficiency. E. P. Sharpey-Schafer.—p. 161.
*Prognosis of Tetanus. L. Cole.—p. 164.
Congenital Cysts of Parotid Gland. T. Moore.—p. 168.
Treatment of Eczema with Vitamin B Complex. K. P. Kristensen and S. N. Vendel.—p. 170.
Cerebrospinal Fluid in Alkalosis. H. Agar and I. Macpherson.—p. 171.
Basal Metabolism in Gastrointestinal Bleeding. D. A. K. Black.—p. 173.
Intestinal Ulceration in Myelogenous Leukemia. E. I. Jones.—p. 174.

Testosterone Propionate and Vasomotor Phenomena.—According to Sharpey-Schafer, it has long been recognized that disturbances of the vasomotor system may follow diminished activity or removal of the gonads in man. The menopause is usually associated with certain symptoms, of which the hot flush is the most characteristic, and the same symptoms develop at an earlier age after surgical removal of the ovaries. These vasomotor phenomena in women can be abolished by treatment with the estrogens. In the male, flushes may follow removal of the testes and can be abolished in a similar manner by treatment with the androgens. Although these facts are clear, the mechanism by which vasomotor phenomena are produced is still obscure. Work on the causation of flushes due to sex gland deficiency has been handicapped by the failure to observe similar symptoms in the experimental animal. The author describes observations in a number of cases which reveal that the administration of large doses of an androgenic substance causes flushes in both men and women with functioning gonads, and the flushes so produced may be stopped by the simultaneous administration of the estrogens in the same manner as spontaneous flushes in women are stopped by the estrogens. Yet, when the flushes are spontaneous, as in castrated women or men, testosterone propionate does not make the flushes more numerous but stops them, even when massive doses are used. These results appear contradictory, but from lack of other evidence the relation to

of the androgens to the flush phenomenon appears to be as follows: In castrates of both sexes administration of androgens appears to inhibit the action of some substances connected with the anterior pituitary. In normal subjects, on the other hand, large doses cause a grave disorganization of the endocrine system, probably consisting of a depression of the gonads and stimulation of the anterior pituitary. The author thinks that this experimental production of flushes by testosterone propionate may help to solve the problem of the causation of the vasomotor phenomena of gonadal deficiency.

Prognosis of Tetanus.—The observations by Cole are based on forty-three consecutive cases of tetanus treated by approximately the same method and closely observed throughout the illness. As soon as the diagnosis has been made, a large dose of antitoxin is given. The wound is not touched for at least an hour and surgical treatment is then limited to the minimum necessary to secure free drainage and irrigation with hydrogen peroxide. Control of reflex spasms is maintained with large doses of bromide in mild cases, and with paraldehyde, or more commonly avertin with amylene hydrate, in basal anesthetic doses by the rectum in severe cases. When either paraldehyde or avertin with amylene hydrate is used, cyanosis is controlled with warm nasal oxygen and atropine. All therapeutic and nursing activities likely to induce reflex spasms are reduced to a minimum. Care is taken that sufficient nourishment in fluid form is given throughout the illness. Antitoxin has in most cases been limited to a single intravenous dose of 200,000 international units, which has not been repeated. Latterly this dose has been reduced to 100,000 international units in a few mild cases, because it became clear that the larger dose was unnecessary. In five of the early cases it was given by the intrathecal and intramuscular routes as well as by the intravenous, and in these cases the injections were repeated during the early days of the illness. From subsequent experience it became clear that this variation in the method of giving antitoxin can have had no effect on the results and the use of the intrathecal method has been abandoned. The prognosis depends on the age and general physique, sex, type, severity and site of the wound, incubation period, rate of onset of symptoms, time at which antitoxin is given, and whether prophylactic antitoxin had been given. Patients over 60 have a small chance of recovery unless the disease is very mild. Cardiovascular degeneration, chronic bronchitis and emphysema, when combined with tonic rigidity of the chest, predispose to pneumonia, which is usually fatal. The prognosis is better in women. There is a direct relationship between the severity of the wound and the severity of the disease. Wounds of the upper limb show a higher case mortality than those of the lower. The incubation period is only a rough guide to prognosis, because it cannot be measured accurately. If it is less than seven days, the prognosis is usually bad; if it is more than fourteen, the prognosis is usually good. The period of onset of reflex spasms is the most useful guide. If these come on within forty-eight hours after the first symptoms of the disease appear, the prognosis is bad; if later, the prognosis is good. There is usually unnecessary delay in making the diagnosis and therefore in giving antitoxin. The administration of antitoxin at the earliest possible moment is as important in tetanus as it is in diphtheria. Prophylactic antitoxin should be repeated in all cases of suspicious wounds. All soldiers before going on active service should be actively immunized against tetanus. It is unnecessary to continue to give antitoxin when reflex convulsions have ceased and only tonic rigidity remains. An exception to this rule is when there is a septic wound which cannot be drained.

Medical Journal of Australia, Sydney

1:71-106 (Jan. 20) 1940

- Management of Acute Appendicitis. K. W. Starr.—p. 71.
Chemotherapy in Treatment of Gonorrhea in Males. V. N. B. Willis.—p. 82.
X-Rays in Treatment of Gas Gangrene. W. H. Godby.—p. 85.

South African Medical Journal, Cape Town

14:1-24 (Jan. 13) 1940

- Truants of Medicine in South Africa. W. L. Gordon.—p. 3.
Social Welfare as a Public Problem from the Housing and Nutrition Aspect. M. Maister.—p. 7.
Some Recent Advances in Urology. S. McMahon.—p. 12.

Presse Médicale, Paris

48:81-96 (Jan. 24-27) 1940

- Subdeltoid Bursitis. A. Basset and J. Meyer.—p. 81.
Realization of "Antigas" Filtrating Boxes of High Neutralizing Capacity and Corresponding to Needs of Respiratory Physiology. L. Dautrebande.—p. 83.
Wounds of Larynx and Their Immediate Treatment. J. Despons.—p. 85.
*Pyloric Stenosis and Pseudostenosis in Nurslings. E. Terrien.—p. 86.

Pyloric Stenosis and Pseudostenosis in Nurslings.—According to Terrien, symptoms of pyloric stenosis can exist in the absence of true organic stenosis of the pylorus. Such cases have been designated as pseudostenosis. The author discusses the signs and symptoms of the pyloric syndrome and the differential diagnosis of pyloric stenosis and pseudostenosis. The syndrome, in his opinion, does not invariably imply the existence of a true stenosis. As long as doubt exists and the general condition remains satisfactory and the weight is maintained, it is advisable to be conservative and to restrict the treatment to medical measures. An attempt should be made to keep the infant in the ventral position. A change of the diet alone may be effective in preventing the formation of an undigested residue, gastric hypersecretion and spasm. The author stresses especially the advantages of small thick meals capable of allaying vomiting by a mechanism the explanation of which has recently been given by Marcel Lelong, namely, that with liquids the infant swallows large quantities of air, whereas with thick food this does not take place. At times it may be sufficient to replace the milk by buttermilk or even by a diet without milk. Gastric lavage should be performed four hours after the meal. It is particularly indicated in the cases in which large amounts of viscous contents are vomited. These may be the cause of the gastrosplasm and the pylorospasm. Their removal may be followed by normal gastric function. If the gastric intolerance becomes more pronounced and is characterized by late vomiting and if the weight decreases rapidly, the surgical operation should not be postponed, for the success of the operation depends on an early intervention. With regard to the late vomiting the author states that in true stenosis this symptom does not begin with birth. On the contrary, the attacks of vomiting appear suddenly after two, three or four weeks of normal development. The author stresses that this lapse of time between birth and the appearance of the symptoms, the so-called free interval, is never missing in stenosis. Even if the intervention does not reveal a stenosis, the surgeon need not reproach himself, because postponing the operation too long involves a greater risk for the child than does the operation.

Gazzetta degli Ospedali e delle Cliniche, Milan

61:73-96 (Jan. 28) 1940. Partial Index

- *Treatment of Exteriorized Parapneumothoracic Empyema. G. M. Rossi.—p. 75.
Pneumococcosis: Clinical Study. A. Bassi.—p. 78.

Parapneumothoracic Empyema.—Rossi observed several cases of septic parapneumothoracic empyema which opened either spontaneously or as the result of surgical intervention. He believes that either type is best treated by converting the open into a closed empyema by blocking the fistula or the surgical wound and treating the condition by thoracocentesis and intrapleural decompression. In spontaneously fistulized empyema the treatment is administered daily, up to the time of closure of the fistula, which as a rule takes place within fifteen or twenty days, after which the frequency and duration of the treatment depend on the general condition of the patient and the state of empyema. It is advisable to give the treatment every other day for two weeks after closure of the fistula, and then every week for two more weeks. In a parapneumothoracic empyema which was opened surgically it is advisable to institute moderate intrapleural aspiration as soon as possible. The proper time for closing the thoracic wound and performing thoracocentesis and intrapleural decompression is determined by the general condition of the patient and need for preserving the drainage or the possibility of discontinuing it. It is advisable to institute the treatment as soon as possible. Thoracocentesis with the resultant intrapleural decompression exerts as a rule a favorable effect on the extent and nature of empyema, controls toxicosis and

improves the general condition of the patient. The parenchymal pulmonary lesions regress and frequently heal. In some cases complete reexpansion of the lung takes place, requiring phrenicotomy or a thoracoplasty.

Klinische Wochenschrift, Berlin

18: 1541-1564 (Dec. 9) 1939. Partial Index

- Malignant Hypertension or Malignant Nephrosclerosis? T. Fahr.—p. 1541.
 *Antiallergic Action of Insulin. W. Brühl.—p. 1545.
 Rapidity and Site of "Nephrotoxin" Fixation in Experimental Glomerular Nephritis. H. Sarre and H. Wirtz.—p. 1548.
 Vitamin C Content of Breast Milk Before and After Boiling. Rosemarie Albrecht.—p. 1550.
 Active Immunization Against Tetanus. K. E. Vogt.—p. 1553.
 Examination of Cloudy Urine. B. Jurukoff.—p. 1555.
 Vitamin Content of Domestic Oils. Marie Maxim and G. Bors.—p. 1555.

Antiallergic Action of Insulin.—In an earlier report Brühl called attention to the favorable influence exerted by the "insulin thrust" on allergic skin diseases, such as urticaria, Quincke's edema and eczema. The insulin thrust, or the intravenous injection of 10 units of insulin, produced a prompt subsidence of the acute cutaneous symptoms and an improvement in the allergic condition of the organism, as indicated by the intervals between the attacks. The results obtained in other types of allergy, such as bronchial asthma, mucous colitis and hay fever, convinced the author that it is possible to influence allergic processes with insulin therapy. In order to explain the antiallergic action of the insulin thrust, Brühl made control tests of the blood picture, the blood pressure, the body temperature and the refractometric serum index. The insulin thrust was found to produce leukocytosis, elevation in blood pressure, increase of the refractometric serum index and decrease in the temperature, that is, a picture which is the reverse of Widal's hemoclastic crisis. Since Widal's crisis must be regarded as a reliable criterion of the existence of an allergic process, the antiallergic character of the insulin thrust seems to be established. The disappearance of the eosinophils together with the changes in the blood picture which indicate a tendency toward sympathicotonia provide further evidence of the strongly antiallergic action of the insulin thrust. The employment of Vaughan's method for the determination of the leukopenic index revealed that allergic patients under the influence of the insulin thrust did not respond with the customary leukopenia to their specific allergen. The cessation of this reaction likewise indicates the antiallergic action of the insulin thrust. The author ascribes these biologic effects of the insulin thrust to the reactive production of epinephrine.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

84: 205-280 (Jan. 20) 1940

- Influenza Epidemic of February-March 1939 in Garrison of Groningen: Bacteriology. J. Mulder assisted by R. van den Berg and R. van Kollem.—p. 214.
 New Guiding Principles for Treatment of Torticollis Spastica (Cerebralis). S. Koster.—p. 225.
 *Clinical Experiences with Desoxycorticosterone Acetate in Addison's Disease. G. A. Kreuzwendich von dem Borne and E. Lopes Cardozo.—p. 231.

Desoxycorticosterone Acetate in Addison's Disease.—The comparatively high price and the lack of uniformity in its preparations are cited by Kreuzwendich von dem Borne and Lopes Cardozo as disadvantages of the treatment of Addison's disease with adrenal cortex extract. The synthetic preparation desoxycorticosterone acetate was found to be a potent substance. The authors cite several investigators who obtained favorable results with this substance. A detailed report of the history of a woman with Addison's disease treated with various therapeutic measures is presented. With a diet low in potassium and with 10 Gm. of sodium chloride, 0.5 cc. of desoxycorticosterone acetate daily was sufficient to maintain a normal blood pressure and mineral balance. The action of 0.5 cc. of desoxycorticosterone acetate was stronger than that of 10 cc. of adrenal cortex extract. With 2 cc. of desoxycorticosterone acetate daily it was possible to maintain the patient in a normal condition even with a low sodium chloride and high potassium intake. The authors admit that desoxycorticosterone acetate may cause undesirable side effects such as high fever, which in the reported case was accompanied by hypoglycemia. In view of the potent action, overdosage is not without danger, especially with high salt intake.

Acta Chirurgica Scandinavica, Stockholm

83: 185-381 (Dec. 31) 1939. Partial Index

- Clinicohistologic Investigation on Hemangioma. K. Boman.—p. 185.
 Hernia Uteri Inguinalis in Male Subjects. O. Nilson.—p. 231.
 Transurethral Resection for Prostatic Obstruction with Report of 17 Patients Past 75 Years of Age. A. Gundersen.—p. 250.
 *Few Observations on Fat Embolism. F. Kolmert.—p. 263.
 *Description of a Family with Preaxial Polydactylism. S. Sjöstedt.—p. 269.
 Experimental Study of Intestinal Motility in Mechanical Ileus. R. Brändberg.—p. 287.
 *Diagnosis and Therapy of Tuberculosis of Epididymis. E. Ljunggren.—p. 307.
 Chondrodysplasia (Ollier's Disease)—Multiple Enchondromatosis. M. Dahle.—p. 329.

Fat Embolism.—Kolmert reports three cases of fat embolism, two of which developed, in connection with fractures and the third as a result of a urethrographic examination, a fatty substance having been used as a contrast medium. The roentgenograms were similar in all three cases, showing diffuse cloudiness and spotty areas of density over both lungs, which remained a long time after the appearance of the fat emboli. The author states that stimulants, blood letting and the administration of fluid had no effect. In two cases, however, treatment with oxygen proved to be highly beneficial and in one of them it saved the patient's life.

Preaxial Polydactylism.—Sjöstedt reviews the present status of the knowledge on polydactylism, particularly with regard to its hereditary transmission. The heredity has been considered by some as recessive, by others as dominant, and still others regard polydactylism as a mutation. Polydactylism frequently concurs with syndactylism, an anomaly which is likewise hereditary. The concurrence of these two anomalies was observed in a family that was investigated by the author. The anomalies could be followed through five generations. A diagram of the genealogic tree of this family records the unilateral and bilateral occurrence of the polydactylism and syndactylism in the different members of the family. It is of special interest that the polydactylism is preaxial in this family; that is, the first toe is duplicated. The more common form of polydactylism is the postaxial one, in which the supernumerary digit is on the outside of the fifth finger or toe. The author arrives at the conclusion that polydactylism in this family was inherited dominantly.

Tuberculosis of Epididymis.—Ljunggren discusses the diagnosis and treatment of tuberculosis of the epididymis on the basis of sixty-eight cases in which operation was performed at Key's surgical clinic in Stockholm during the period from 1927 to 1937. In 60 per cent of the cases it was possible to establish tuberculous infection of the glands of the lungs or the hilus; however, in only seventeen cases (25 per cent) did active pulmonary tuberculosis exist up to the time of the operation. In 50 per cent of the cases renal tuberculosis existed previously or simultaneously or it developed later. This high percentage indicates that it is necessary to resort to urologic examination in all cases, so as to detect possible renal tuberculosis. Urethrography is valuable in the diagnosis of tuberculosis of the prostate. In the author's material it was employed in twenty-eight cases. Cavities filled with contrast medium were observed in fourteen cases, even in some in which nothing abnormal could be found on rectal examination. Roentgenologic examination of the epididymis is of slight diagnostic value. Calcium shadows characteristic of tuberculosis could be found in only one case. Ten cases were bilateral before the beginning of treatment. In the other fifty-eight, which were unilateral, epididymectomy was performed thirty-nine times. There were fourteen recurrences. Semicastration was carried out nineteen times, and in these cases recurrence of tuberculosis in the other epididymis occurred thirteen times. In fifty-five cases it was possible to ascertain the fate of the main testicle after epididymectomy. It was intact in forty cases, in ten cases it had been secondarily extirpated and in five cases it had undergone extensive atrophy. Of the patients operated on, 31 per cent died in the course of the first five years from some tuberculous disease (pulmonary, renal or military tuberculosis). It is of importance, therefore, that patients who have had an operation for tuberculosis of the epididymis should be kept under continuous observation and the operation followed by climatic and dietetic after-treatment.

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PULMONARY EMBOLISM

SUGGESTIONS FOR ITS DIAGNOSIS, PREVENTION AND MANAGEMENT

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When patients die of pulmonary embolism following operation or childbirth, a feeling of helplessness and discouragement prevails until the incident is forgotten. Many months pass before the occurrence of the next one. It is remarkable, however, that the survey of large collective statistics reveals a fairly steady incidence in large services, namely from 0.1 to 0.2 per cent of all operations, 2 per cent of all deaths, 6 per cent of postoperative deaths and about 10 per cent of all autopsies. The prevention of postoperative or postpartum thromboses and the investigation of types of patients, types of diseases and types of operations which are especially endangered by pulmonary embolism are possible avenues of approach to the problem. In this discussion, however, we wish to limit ourselves to observations on the value of early diagnosis and the employment of simple procedures which may reduce its incidence and its high mortality.

THE GROUPING OF PATIENTS HAVING PULMONARY EMBOLISM

It is customary to speak of medical and surgical cases of embolism. While the medical group chiefly consists of cardiac patients or patients suffering from malignant growths in the terminal stages, the surgical group comprises patients with a postoperative or postpartum embolism. This classification is of some practical importance, as obviously the diagnosis in the medical group will be obscured by the symptoms of heart disease; also a patient with a failing heart or in a dehydrated, demineralized, debilitated state is less responsive to therapeutic measures than one in the surgical group.

Of 100 cases of pulmonary embolism which were taken from the records of St. Luke's and the Research and Educational Hospitals of Chicago, twenty-five were medical, seventy-four were surgical and one was obstetric. The cases were accepted for study only (1) if there was a postmortem verification of the diagnosis or (2) if the course of the disease, whether fatal or not, revealed evidence of thrombophlebitis, hemoptysis or x-ray evidence of infarction and other conditions simulating embolism could be reasonably excluded. Fat emboli were not included in this series, as they represent a somewhat different problem.

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THE DIAGNOSIS

Table 1 shows the primary diagnosis of patients who suffered pulmonary embolism in the order of their frequency. Unless these can be related to the total number of admissions during the same period, the absolute figures are not conclusive; but it is sufficiently clear that of the medical group the cardiac patients, and of the surgical group the patients subjected to pelvic laparotomy, seemed to be most frequently affected. When these cases are examined from the standpoint of immobilization and venous stagnation in the pelvis, the importance of these two factors receives renewed emphasis.

Of special interest have been the initial symptoms and signs of pulmonary embolism as recorded in the nurses' notes (table 2). These were often made by student nurses during the excitement of seeing perhaps one of their first emergencies. Nevertheless the three leading symptoms of dyspnea, chest pain and cyanosis are well brought out; the fall in blood pressure, which was not recorded except in the last few years, is suggested by the notes of weak, rapid pulse, shock and restlessness. Abdominal symptoms, which in our experience have occasionally led to diagnosis of acute cholecystitis, ruptured viscus and other conditions, are represented. Cerebral anemia is signified by convulsions or dizziness.

There are, of course, far more complete and detailed descriptions of symptoms in individual cases, but we wish to emphasize these simple and often incomplete observations to show that emergency measures, when instituted immediately after the early observations of the nursing staff, might be adopted if the time interval between first symptoms and death was not too short. To study this angle table 3 was prepared. These time intervals are rather striking, as it is a customary comment with regard to therapeutic efforts in pulmonary embolism that patients either die before anything can be done or recover anyway. In this group of seventy fatal embolisms 8.5 per cent died in less than ten minutes and roughly 60 per cent lived more than one hour, 34 per cent living from one to several days. There is certainly time to institute certain measures during this period, and their discussion will follow later.

Brief mention should be made of the value of roentgenograms, especially in the early hours or days following the embolus. Perhaps insufficient emphasis has been placed on the fact that an embolus is not equivalent to a pulmonary infarct. The obstruction of an artery in the lung will produce hemorrhagic infarcts only in case of secondary venous thrombosis.¹ If an anemic infarct occurs it can often give the picture of a localized emphysema because of the concomitant bronchial obstruction, which is usually incomplete, so that air is

1. Karsner, H. T., and Ash, J. E.: Studies in Infarction: II. Experimental Bland Infarction of the Lung. *J. M. Res.* 27: 205, 1912-1913.

aspirated into the alveoli but cannot be exhaled. These partial bronchostenoses have been studied roentgenologically in great detail by Westermarck.²

PRECIPITATING FACTORS IN PRODUCING EMBOLISM

A problem frequently arises when a manifest thrombophlebitis is present or when pulmonary infarction has already occurred and another one is feared; namely,

TABLE 1.—Type of Diseases or Operations Followed by Pulmonary Embolism in 100 Cases, 1926-1938

A. Medical Group		B. Surgical Group	
Heart disease.....	18	Pelvic laparotomy.....	33
Phlebitis.....	2	Prostatectomy.....	8
Malignant growths.....	2	Cholecystectomy.....	5
Brain tumor.....	1	Herniotomy.....	5
Pulmonary emphysema.....	1	Appendectomy.....	5
Pyelonephritis.....	1	Fracture.....	5
	25	Malignant growths.....	3
		Osteomyelitis.....	3
C. Childbirth.....	1	Amputation.....	3
		Lobectomy.....	1
		Phrenico-exeresis.....	1
		Infected scalp.....	1
		Laminectomy.....	1
			74

the recognition of tangible factors which are responsible for the breaking loose of the clot. Again using the nurses' records as a basis, table 4 was prepared. Bowel movement and active or passive physical exertion seem to head the list of known causes. The milking action of a large enema, straining on the bedpan or getting out of bed for the first time are well known precipitating factors; reverse gastrointestinal peristalsis seems to have preceded the embolus in at least two cases; whether the one case of hiccup brought on the embolus or was the result of a lower lobe infarct, with diaphragmatic irritation, cannot be decided. In seventy of 100 cases, however, no obvious precipitating factor could be elicited; this emphasizes that, outside of purely mechanical factors, possibly physiochemical changes may be at play, which result in uneven clot retractility,³ so that the tail of the thrombus will freely float in the venous stream and can readily break off. We have also considered the meteorologic influences on the mobilization of the clot; this study has been undertaken by Dr. William F. Petersen and one of us (G. de T.).^{3a}

TABLE 2.—Initial Symptoms and Signs of Pulmonary Embolism as Recorded in the Nurses' Records in 100 Cases

Dyspnea.....	42	Weak rapid pulse.....	26
Pain in the chest.....	32	Shock.....	12
Cyanosis.....	24	Restlessness.....	9
Nausea and vomiting.....	6		
Pain in abdomen.....	5		
Chill.....	4		
Convulsion.....	3		
Dizziness.....	2		
Four patients were found dead			

The mortality under discussion was very high. Eighty-seven patients died and only thirteen recovered; eleven patients of the 100 showed a typical thrombophlebitis of one or both lower extremities; with the exception of two patients, the embolus preceded the appearance of the typical milk leg. A surprisingly high number of patients had more than one infarct (table 5). It would seem from this small series that if a patient

survived one pulmonary embolus he would have a 41 per cent chance of having another one; but if he survived the second one he would have only a 12 per cent chance of having any more.

Of the eighty-seven deaths due to pulmonary embolism, for only thirty (34 per cent) are autopsies available; but one very interesting observation was made in this small series. In eight autopsies, or 27 per cent of the group, a fatal pulmonary embolism occurred with a patent main pulmonary artery, only the left or right artery or a small branch being obstructed (table 6). This feature, also emphasized by Leriche and his co-workers,⁴ would suggest that other factors besides the mechanical plugging of the lesser circulation may be at play.

Bronchial obstruction in pulmonary embolism has been ignored in the past. And yet at autopsy and in the experimental animal one frequently sees blood and mucus plugging the bronchial tree. In fact the plug may so completely close the bronchus that atelectasis may result in the corresponding area. In addition there is some evidence of bronchial spasm accompanying experimental pulmonary embolism.⁵ The mechanism of this phenomenon will be understood when a study of some reflexes occurring during pulmonary embolism is reviewed.

TABLE 3.—Fatal Pulmonary Embolism in Seventy Cases

Time Elapsed Between First Symptoms and Death	
Found dead or died immediately.....	3
Ten minutes or less.....	3
From ten minutes to one hour.....	16
From one to twelve hours.....	20
From twelve to twenty-four hours.....	4
From one to several days.....	24
Total	70
Died in less than ten minutes.....	8.5%
Died in less than one hour.....	35%

In a previous paper⁶ evidence was presented that death from pulmonary embolism is not always due to asphyxia, failure of the right heart or insufficient venous return to the left heart. True enough, these conditions prevail when the main pulmonary artery or both right and left branches are simultaneously obstructed, but there are enough postmortem records to indicate that patients may die from a small embolus obstructing an insignificant area of the lung. In addition, our animal experiments have shown that dogs when given a fatal quantity of embolizing material may be saved in at least 50 per cent of the cases if they receive atropine or if their vagi are cut. We with Fenn have also presented electrocardiograms of dogs indicating strong vagal effects on the heart, which may be abolished with atropine.⁷ On the basis of these animal experiments and others which deal with vagal effects on the bronchial tree and the gastrointestinal tract, we feel that a widespread radiation of autonomic reflexes occurs during pulmonary embolism, which may contribute to the causes of death (fig. 1).

As the vagus constricts the smooth muscles of the coronaries, the bronchi and the upper gastrointestinal

2. Westermarck, Nils: The Roentgen Diagnosis of Pulmonary Embolism, *Acta radiol.* 19:357, 1938.
3. Lampert, Heinrich: Thrombose und Embolie, Dresden, Theodor Steinkopff, 1933.
3a. de Takats, Geza; Mayne, A., and Petersen, W. F.: The Meteorologic Factor in Pulmonary Embolism, Surgery, to be published.

4. Leriche, René; Fontaine, René, and Friedmann, Léon: L'infarctus stellaire est-elle justifiée dans l'embolie pulmonaire du point de vue physiologique? *J. de chir.* 50:737 (Dec.) 1937.
5. Singh, Inderjit: Certain Effects of Pulmonary Gas Embolism, *J. Physiol.* 87:11 (June 10) 1936. Binet, Léon, and Buvier, P.: Recherches sur la motricité des bronches, *Presse méd.* 47:217 (Feb.) 1939.
6. de Takats, Geza; Beck, W. C., and Fenn, G. E.: Pulmonary Embolism, *Surgery* 6:339 (Sept.) 1939.
7. de Takats, Geza, and Fenn, G. E.: Studies in Pulmonary Embolism.

tract, to atropine, which blocks the vagal impulse, the use of papaverine, a relaxer of contracted smooth muscle, was added. These animal experiments led to the proposal that, in the emergency treatment of pulmonary embolism, wide use be made of the inhibition of such reflex changes.

ATTEMPTS TO REDUCE POSTOPERATIVE
THROMBOSIS AND EMBOLISM

Of the several factors predisposing to postoperative thrombosis, much attention has been paid lately to the changes in the composition of the blood. These have recently been summarized as follows:⁸ an increase in the number of platelets occurs regularly after any major operation, with a maximal peak between the eighth and eleventh days; there are an increase in fibrinogen, a shift of the albumin-globulin ratio in favor of the globulins and an increase in blood viscosity. All these factors facilitate the agglutination of platelets. The coagulation of the blood is favored by the postoperative leukocytosis and the increase in platelets, both of which liberate thrombokinase and hasten the coagulation of stagnating blood adjoining an obstructing platelet thrombus.

The importance of clean, sharp dissection, avoidance of undue trauma to the tissues, and the possible elimination of sources of infection have been repeatedly emphasized. That age, overweight and operations on the lower part of the abdomen, the pelvis and the lower extremities predispose to thrombosis is common knowledge. Climate, barometric pressure, too much intravenous medication and diet are factors worthy of discussion. But little attention has been paid to counteracting the marked retardation of blood flow

The veins of the pelvis and the lower extremities are the most favorable sites for stasis. In patients immobilized in bed, the drainage from the femoral vein is slow. Superficial breathing and intestinal distention further interfere with adequate venous drainage. Tight abdominal binders and a motionless rigidity due to postoperative pain do not encourage venous backflow.

TABLE 6.—Partial Embolization of the Pulmonary Arterial Tree Producing Death

Case, Age, Sex	Symptoms Preceding Death	Time Interval Between First Symptoms and Death	Postmortem Observations
E. M. 61 ♀	Restlessness, hemoptysis, fall in blood pressure	7½ hours	Mural thrombi left and right ventricle, embolism right pulmonary artery
J. R. 52 ♀	Dyspnea, pulmonary edema, fall in blood pressure	15 hours	Thrombosis of urethral veins, right upper lobe infarct, embolus in right auricle and ventricle
M. H. 62 ♀	Severe dyspnea and cyanosis	4¾ hours	Embolus left pulmonary artery
H. H. 65 ♂	Cyanosis, dyspnea, loud heart tones on right, fall in blood pressure	3 days	Multiple thrombi of the smaller arteries, hemorrhagic infarct right lung, fatty myocardium
P. W. 42 ♂	Dyspnea, chest pain, feeling of choking	13 hours and 40 minutes	Obliterating thrombosis of a main branch of right pulmonary artery, infarct lower lobe right lung
A. J. 33 ♀	Pallor, syncope, diaphoresis following straining after enema, pulse and respiration slowed down	45 minutes	Obliterating embolus of second division of right pulmonary artery, thrombosis right perirenal vein
B. M. 42 ♀	Acute gastric dilatation, emesis, cyanosis and dyspnea	35 minutes	Molded emboli of the right auricle and right pulmonary artery, atelectasis of the lungs, partially organized thrombi right common iliac vein
C. McD. 62 ♀	Dyspnea, apprehension, cold and clammy skin	3 hours and 10 minutes	Molded blood clots in right ventricle and branches of the left pulmonary artery, small mural thrombus left hypogastric vein

Recently two important monographic studies by Frimann-Dahl⁹ shed very accurate information on the movements of the diaphragm and on the retardation of venous flow after operations. This author followed the respiratory excursions of the diaphragm before and several times after the operation in twenty cases and found that from one to twelve days after the operation there is a very marked reduction in the movements of the diaphragm. This is especially true in upper abdominal operations, the site of the surgical wound affecting the homolateral diaphragm very conspicuously. In this connection the experimental work of Nissen and Wustmann¹⁰ is interesting. These workers determined the emptying time of the inferior vena cava before and after phrenicotomy and found that the disappearance time of the contrast material doubled after the diaphragm was paralyzed. Frimann-Dahl further determined the emptying time of the saphenous vein before and after operation and in patients who have been bedridden for a long time. He injected a small amount of opaque substance into the saphenous vein and watched its disappearance under fluoroscopy. Normally this took from five to thirty seconds. Bedridden patients, unless they had toxic thyroids, showed a

9. Frimann-Dahl, J.: Diaphragmbewegungen und der postoperative Venenstrom, Acta chir. Scandinav., 1935, supp. 36, pp. 1-168.
10. Nissen, R., and Wustmann, O.: Der Einfluss pathologischer Zwerchfellstandes auf die Blutströmung in der unteren Hohlvene, Deutsche Ztschr. f. Chir. 203-204: 42, 1927.

TABLE 4.—Precipitating Factors in Producing Embolism

Bowel movement.....	15
Getting in and out of wheelchair.....	6
Morning care.....	3
During or immediately after operation.....	3
Nausea from smelling ether.....	1
Insertion of Levine tube.....	1
Hiccup.....	1
No obvious cause.....	70
Total.....	100

TABLE 5.—Number of Pulmonary Embolizations in 100 Cases

Number of Emboli	Number of Patients*
1.....	61 (5)
2.....	27 (3)
3.....	7 (2)
4.....	2 (1)
5.....	2 (1)
6.....	1 (1)
	100 (13)

* Figures in parentheses indicate nonfatal emboli.

which occurs after every major operation and after childbirth. Yet every textbook dealing with thrombosis depicts the slowing of the circulation resulting in the narrowing of the axial stream, with the leukocytes and later the platelets assuming a marginal position.

Stagnation of venous blood alone will not produce an agglutination of platelets or their fixation to the vessel wall unless other factors are in operation. Nevertheless it is one of the most important and most readily controllable factors in postoperative thrombosis.

8. de Takats, Geza: Chapters on Thrombosis and Embolism, in Christopher, Frederick: Textbook of Surgery, ed. 2, Philadelphia, W. B. Saunders Company, 1939.

retardation to from one to two minutes, whereas after major abdominal operation the emptying time was prolonged to from three and one half to four minutes. This retardation was noticeable on the day following the operation but gradually increased up to the fifth or sixth day. In some cases the venous flow was practically stagnant up to the time when the patient first got up.

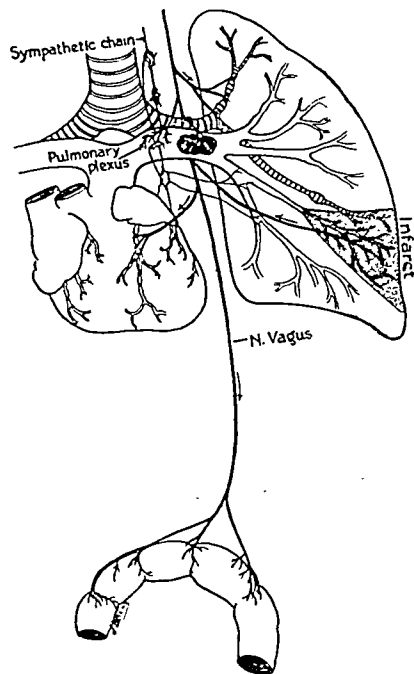


Fig. 1.—The afferent impulses travel mainly in the vagus and radiate back to the lung as bronchoconstrictor and bronchodilator fibers. They may constrict the secretory fibers. They may inhibit the coronaries, produce vagal inhibition of the heart and depress blood pressure. They can radiate to the upper gastrointestinal tract and produce colics, increased peristalsis and reverse peristalsis. The plug may produce a stimulation of the sympathetic vasoconstrictors or a more general dilatation of the right heart (Bainbridge reflex). The hypertension in the right heart and in the pulmonary artery seems to be the main stimulus for these widespread reflexes, although the rise in intrapulmonary pressure, the congested lung and the irritated pleura all have been shown to act as reflexogenic factors. From Surgery 6: 339 (Sept.) 1939.

to encourage venous return from the extremities, using a large control group of 3,153 patients for whom this position was not employed, and found a 30 per cent reduction in the morbidity rate of pulmonary complications. As a postural drainage of beginning pulmonary complications this position may really be worth while. Lueth¹³ completed the study of 101 pulmonary abscesses treated by from 5 to 10 degrees of a Trendelenburg position with striking results. He also gave some valuable practical hints as to the proper bedding and the prevention of raising the chest and head by pillows and thereby producing a jackknife position.

Since Gray's communication, we have placed all patients after a major operation in a Trendelenburg position for twenty-four and occasionally for forty-eight hours (figs. 2 and 3). Excluded from such a

position must be patients with intra-abdominal suppuration or with cardiac failure when such a position would lead to dyspnea. A 5 per cent angle can be readily accomplished by elevating the foot of the bed for from 8 to 10 inches (20 to 25 cm.). In case of shock this angle is usually increased to 10 degrees by doubling the elevation.

In the last five years 350 patients have been placed in this position at St. Luke's Hospital and the Illinois Research and Educational Hospitals. There was no postoperative thrombosis in this group, and the incidence of pulmonary complications as detected by clinical examination was 3 per cent. At the same time a group of 1,000 surgical cases at these institutions showed five cases of postoperative thrombosis. It was difficult to get adequate data of postoperative pulmonary complications, but they were marked in the charts in 28 per cent. It is obvious that our limited material is not well comparable to the control groups, as there were no pelvic laparotomies and prostatic operations on aged patients among the 350 cases; while suggestive, it does not permit any conclusions.

Besides diaphragmatic movements and abdominal distention, the inactivity of these patients is an important factor. To overcome this and to improve venous backflow by active muscular contractions, we have used ordinary bicycle pedals that are mounted to the foot end of the bed. The two shafts of the pedal have to be balanced. A washer prevents undue friction, and the pedals are placed in a wooden frame with a bracket reinforcement (fig. 4). The pedals can be tightened or loosened so that they can be used with more or less resistance. The patients pedal on this stationary bicycle for five minutes three times a day starting on the third postoperative day. As we believe in relieving postoperative pain by enough morphine to insure deep breathing and avoid motionless rigidity in one position, only seldom has any objection been raised on the part of the patient. In fact it serves in part as

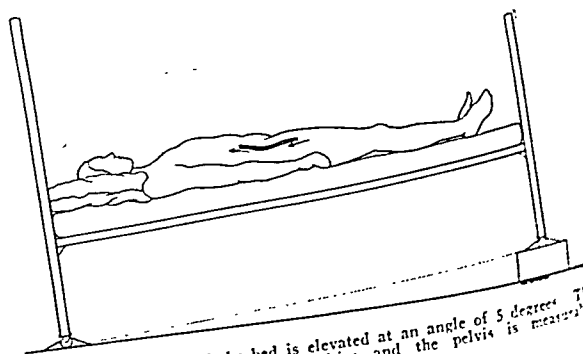


Fig. 2.—The foot of the bed is elevated at an angle of 5 degrees. The venous backflow from the extremities and the pelvis is measurably accelerated.

occupational therapy and encourages the patient to make active movement in bed. Regular breathing exercises and mild active movements of the lower extremities are equally effective.

This simple apparatus, which can be assembled easily for a few dollars, has also proved of value in mobilizing knee, ankle and hip joints, as an active vascular exercise and as a yardstick to measure intermittent claudication.

In case of a suspected or manifest venous thrombosis the exercise is naturally contraindicated. Nor can it be used if the necessary amount of motion causes pain.

11. Walters, Waltman: Method of Reducing Incidence of Fatal Postoperative Pulmonary Embolism: Results of Its Use in 4,500 Surgical Cases, Surg., Gynec. & Obst. 50: 154 (Jan.) 1930.
12. Gray, H. K.: The Use of the Trendelenburg Position in the Prevention of Postoperative Pulmonary Complications, Proc. Staff Meet., Mayo Clin. 9: 453 (Aug. 1) 1934.
13. Lueth, H. C.: The Treatment of Lung Abscess as Judged by One Hundred and One Cases, Illinois M. J. 68: 440 (Nov.) 1935.

Following acute suppurative processes requiring complete immobilization, its use is obviously out of place. But in the majority of instances it is a simple and efficient method to promote venous backflow and to counteract inactivity. Only a large group of statistics can show whether early mobilization really is capable

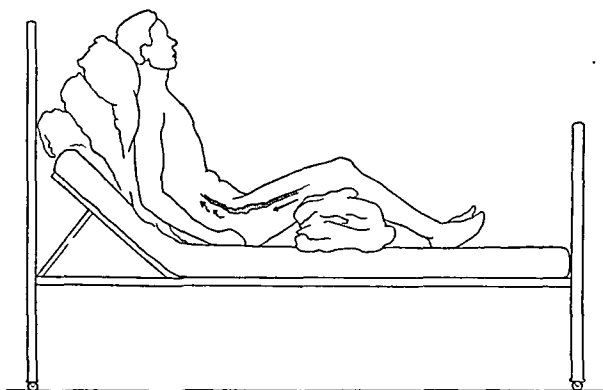


Fig. 3.—A frequent postoperative position. There is a stagnation of venous blood at Poupert's ligament and in the pelvis.

of reducing the incidence of postoperative thrombosis. Such statistics are now being gathered from the Department of Gynecology by Dr. William F. Geittmann.

THE MANAGEMENT OF PULMONARY EMBOLISM

In proposing any emergency measures in cases of pulmonary embolism, one must recognize that a correct diagnosis is not always made and only measures should be used which would do no harm even if pulmonary embolism were not present. Nygaard¹⁴ in analyzing 289 deaths due to pulmonary embolism found that the diagnosis has been missed in 17.65 per cent of the cases. The causes of death in the erroneously labeled cases in order of their frequency were (1) cardiac failure and coronary occlusion, (2) indeterminate diagnosis, (3)

TABLE 7.—The Effect of Atropine, Papaverine or Both on the Mortality from Pulmonary Embolism

	Number of Cases	Survived	Percentage
Treated*.....	22	18	82
Control.....	100	13	13

* Cases of Burk, Denk, de Takats, Collins and Muller. The untreated series is our own.

shock and hemorrhage, (4) peritonitis, (5) pulmonary edema, (6) coma, (7) cerebrovascular accidents and (8) other conditions.

When cyanosis and dyspnea are the predominant symptoms oxygen by catheter, or preferably 100 per cent oxygen with the new mask of Boothby and his associates, is logical.¹⁵ Our animal experiments showed that tracheal insufflation of oxygen protected some of the animals from death when a peripheral, asphyctic type of embolism was produced. It is common clinical knowledge that oxygen administration is helpful in cyanosis and dyspnea of pulmonary embolism. While our experience with 100 per cent oxygen in cases of pulmonary embolism is very limited, it should be more

effective in raising the low oxygen saturation of the arterial blood than the customary administration of from 40 to 60 per cent oxygen. An oxygen tank should be available on every surgical floor.

The massive pulmonary embolism, however, is characterized by pallor, fall in blood pressure and retrosternal pain; there is hardly any cyanosis and the peripheral arterial blood shows a normal oxygen saturation. It is this syncopal type of embolism for which we advocate the use of papaverine and atropine: the former in doses of one-half grain (0.03 Gm.), the latter in doses of from $\frac{1}{60}$ to $\frac{1}{75}$ grain (0.001 to 0.0008 Gm.). Both drugs should be given intravenously, as absorption from subcutaneous or intramuscular sites is too slow in such patients. All surgical floors are equipped with one-half grain powders of papaverine and $\frac{1}{150}$ grain tablets of atropine, and the drugs are dissolved in a few cubic centimeters of physiologic solution of sodium chloride and boiled over a flame just before use. While ampules of papaverine are on the market, the stability of such solutions is variable and the drug is apt to be most potent when dissolved just before use.

Papaverine alone has been used previously in cases of pulmonary embolism (table 7). A comparison of such a small series of patients with a larger series not having received any medication is hardly absolute proof, but it does reveal the marked drop in mortality when papaverine is used. The addition of atropine we feel is important. It has been used in our service for over one year not only in the severe, massive types of embolism but following the milder infarcts as a pro-



Fig. 4.—Bicycle pedals are mounted on the foot end of the bed. The amount of resistance is controlled by tightening or loosening the wooden frame.

phylactic dose, such patients receiving both drugs three times a day for several days.

The following history is illustrative:

Mrs. E. T., a Negro woman aged 33, had a syncopal attack of pulmonary embolism ten days after a cholecystectomy. The blood pressure fell from 120 systolic, 85 diastolic to 70/58. Atropine $\frac{1}{75}$ grain and papaverine one-half grain were given intravenously by Dr. John Lindquist thirty minutes after the

14. Nygaard, K. K.: Pulmonary Emboli: Consideration of Clinical Diagnosis and Possibilities for the Trendelenburg Operation, Proc. Staff Meet., Mayo Clin. 13: 586 (Sept. 14) 1938.

15. Boothby, W. M.; Mayo, C. W., and Lovelace, W. R. 11: One Hundred per Cent Oxygen: Indications for Its Use and Methods of Its Administration, J. A. M. A. 113: 477 (Aug. 5) 1939.

onset of symptoms. The pulse immediately became stronger and the patient emerged from a seemingly moribund state; oxygen was started, which relieved the dyspnea. Seventeen days later, after an afebrile period of seven days, a second embolism occurred which again was aborted with atropine and papaverine. Six electrocardiograms are available for this period, taken one, two, eight, sixteen, twenty-three and thirty-two days after the onset of the first embolus (fig. 5). A seventh one was taken several months later.

COMMENT

Elsewhere⁷ we have presented electrocardiograms of other patients which illustrate our belief (1) that small or significant electrocardiographic changes which are reversible may take place after pulmonary embolism, (2) that the fall in blood pressure is not responsible for these changes and (3) that the abnormal tracings are not caused by organic coronary occlusions. The latter point gains powerful support from the recent postmortem studies of Friedberg and Horn,¹⁶ who found 31 per cent of myocardial infarctions without any coronary occlusion. Twelve cases were associated with pulmonary embolism. They felt that an acute coronary insufficiency caused the myocardial ischemia and the coronary insufficiency occurred because of the fall in blood pressure, the associated asphyxia and possibly exaggerated vagal reflexes. They stated that pulmonary embolism is most likely to cause myocardial ischemia

This work was quoted in more detail because its conclusions, which resemble ours, have been reached from a purely morphologic approach. It is difficult to convince some pathologists of an acute coronary insufficiency with a consecutive myocardial ischemia, unless they can see the occluded artery. And yet the analogy with Raynaud's disease, in which gangrene may occur because of prolonged spasm of the digital vessels and without demonstrable obstruction to the arteries, is obvious.

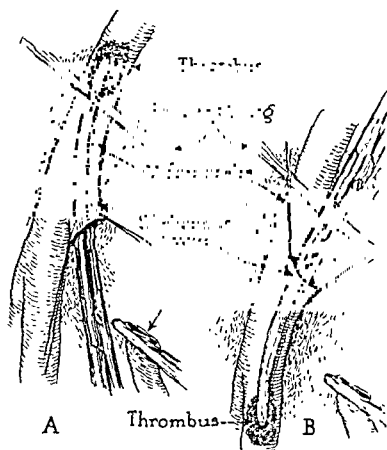


Fig. 6.—P. de Vr., a man aged 44, had three pulmonary infarcts originating in a deep and superficial thrombophlebitis of the left lower extremity. Eighteen days after the first infarct the left saphenofemoral junction was exposed under local anesthesia in the patient's room. The tissues were edematous and the perivenous lymph glands were enlarged. The saphenous vein was thickened, hyperemic and surrounded by a periphlebitic exudate. A small section was excised close to the saphenofemoral junction and the femoral vein was probed both proximally and distally with a curved uterine forceps. While the distal portion seemed free, blood flowed under a very small stream from the proximal end. Following several probings and gentle massage from above, brisk flow occurred. No solid mass was actually recovered. The saphenous vein was tied flush with its junction. Skin clips were applied. The patient was reexamined three months later. He had no further infarcts. A slight thrombophlebitic edema had persisted up to that time and could be controlled with elastic support.

The concept that reflex cardiac deaths may occur, or that depressor reflexes originate from the acute pulmonary hypertension and reflex bronchial spasms, does not mean to belittle the importance of the obstructive plug in the artery, the successful removal of which has been possible only nine times in 132 attempts, a mortality of 93.2 per cent. It should be pointed out, however, that these embolotomies were all performed in the rapidly fatal cases, with the patient in

a moribund state. Pilcher¹⁷ has recently suggested that the slowly dying patients might be operated on two or three hours after the onset of symptoms, while not in a moribund state but showing no improvement. This would make pulmonary embolotomies not desperate, last minute attempts, but deliberate surgical procedures. From table 3 it can be seen that 60 per cent of our patients lived longer than one hour.

In cases of recurring infarcts, another surgical procedure must be considered; if the clot is recognizable and may be localized to one of the iliofemoral veins, its gentle extraction may be attempted through the saphenous vein (fig. 6). We have come to this decision after watching one patient die after the sixth and another after the eighth infarct. Two clearcut pulmonary infarcts from a well localizable source would prompt us again to expose the iliac vessels.

This procedure is not identical with ligation of the hypogastric or common iliac veins in septic thromboses. The limitations of that method have been the subject of previous controversy and are not germane to our present discussion of bland, static thrombi.

CONCLUSIONS

Postoperative thrombosis and embolism continues to be one of the unexpected and seemingly unavoidable complications of surgery. One of the predisposing

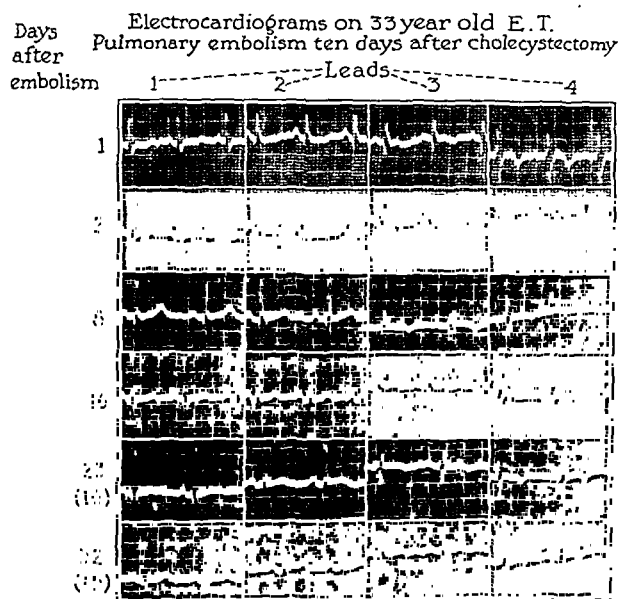


Fig. 5.—Electrocardiograms on E. T., a woman aged 33. Pulmonary embolism ten days after cholecystectomy. One day after severe massive pulmonary embolism: sino-auricular tachycardia; T₁ low, T₂ low, T₃ and T₄ inverted; deep Q₃; QRS complex low in leads 1, 2 and 3. Two days after embolism: sino-auricular tachycardia; T₁ and T₂ low, T₃ and T₄ inverted; deep Q₃. Eight days after embolism: sinus rhythm; T₃ and T₄ inverted; marked improvement as compared with first tracing. Sixteen days after embolism: sino-auricular tachycardia; deep Q₃; T₃ and T₄ depressed; as compared with previous tracing the ST segment in lead 1 is more nearly normal. There is less depression of T₃ and T₄. Twenty-three days after first, six days after second embolism: as compared with previous tracing, T waves are more depressed in all leads. Thirty-two days after first, fifteen days after the second embolism: sinus rhythm; ST segment slightly elevated; T₁ inverted; deep Q₃; as compared with previous tracing T₁, T₂ and T₃ more nearly normal; T₄ still inverted; marked improvement.

if there is recurrent embolization, if the coronary arteries are sclerotic, if the heart is previously hypertrophied and if there is adequate duration of life after the embolism.

16. Friedberg, C. K., and Horn, Henry: Acute Myocardial Infarction Not Due to Coronary Occlusion, J. A. M. A. 112:1675 (April 29) 1939.

17. Pilcher, R. S.: Slowly Fatal Pulmonary Embolism, Lancet 2:10 (Oct. 22) 1938.

factors in thrombosis, namely retardation of venous return from the lower extremities and the pelvis, has been emphasized and a simple measure has been utilized partly to overcome stasis in the tributaries of the inferior vena cava. Because of our belief that reflexes originating from the occluded pulmonary arterial tree may contribute to the causes of death from pulmonary embolism we have suggested simple emergency measures which tend to inhibit such reflexes; for the cyanosis, oxygen inhalations are obviously helpful. In the slowly fatal cases of pulmonary embolism or in the recurrent embolizations to the lung from a well localizable source, surgical measures deserve serious consideration.

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THE RELIEF OF SYMPTOMS OF MAJOR TRIGEMINAL NEURALGIA (TIC DOULOUREUX)

FOLLOWING THE USE OF VITAMIN B₁ AND
CONCENTRATED LIVER EXTRACT

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The present report concerns a study, extending over more than a year, of the effects of massive vitamin therapy in the relief of major trigeminal neuralgia in fifty-eight cases of tic douloureux, four cases of sphenopalatine neuralgia and nine cases of "atypical facial neuralgia."

One reason that led us to undertake this study was an experimental and physiologic interest in the possible effectiveness of vitamin B₁ in the relief of tic douloureux, in view of the effectiveness of this vitamin in relieving the polyneuritis of chronic alcoholism and pregnancy.

Another reason was the desirability of finding, if possible, some alternative to the most effective treatment yet available for tic douloureux, partial or total section of the sensory root of the gasserian ganglion. Adequate surgical therapy is not available to many sufferers with this disease; in some the pain, though extremely troublesome, is hardly so severe as to persuade the patient to submit to the necessary operation. Another occasional limitation of surgical therapy is that when the first division of the fifth nerve is involved the necessary total section of the sensory root incurs grave danger of loss of the eye on the affected side.

Present palliative treatments of trigeminal neuralgia are, on the whole, unsatisfactory. Inhalation of trichloroethylene, which relieves some sufferers at first, frequently becomes totally ineffective later. The other commonly used palliative treatment, alcohol injection of the trunk of the nerve, often affords relief repeatedly for periods varying from months to years. Yet many patients have reported to us their failure to obtain relief from alcohol injection. Whether this was the fault of

the operators or of some peculiarity of their condition we were unable to determine.

The advantages of the treatment which we have evolved are that it is available everywhere or can be easily made so, and that it can be administered by any practitioner and, with some instruction, even by the patient himself.

This treatment may be divided into two parts: (1) active therapy and (2) modification of diet, with some nutritional supplements. The active therapy consists of intravenous injection of 10 mg. daily of thiamin chloride. Vitamin B₁ is as effective by the intramuscular route as intravenously.

About 25 per cent of our patients failed to respond satisfactorily to the vitamin B₁ therapy alone. Recalling the improvement in cases of pernicious anemia with spinal cord degeneration following the injection of concentrated liver extracts, we have been administering a liver extract to the group of patients slow to recover with vitamin B₁ alone. This extract (15 U. S. P. anti-anemia units per cubic centimeter) is given in 0.5 cc. doses intramuscularly thrice weekly.¹ These patients therefore obtain 22.5 U. S. P. units weekly. The results that we have obtained have encouraged us to continue its use.

Some trials were made with a cruder liver extract (Lilly, 1 U. S. P. unit per cubic centimeter) weaker in the anti-pernicious anemia principle but richer in other liver factors. This appeared to be less effective than the purer product containing a high concentration of anti-pernicious anemia principle.

For those patients who have had insufficient relief after several months' treatment with vitamin B₁ and liver injections we are inclined to recommend the daily injection of 100 mg. instead of 10 mg. of vitamin B₁. There are a few cases, but only a few according to our experience, in which this massive dose is necessary. We have not observed any signs of toxicity following the intravenous injection of 100 mg. of thiamin chloride daily for months.

The diet consists of a high vitamin-low carbohydrate diet.² In addition to a routine physical and neurologic examination the blood was studied (hemoglobin, cells and Wassermann reaction), and roentgenograms were taken of the head to exclude possible dental abnormality as a cause of the pain.

In most but not all cases the diet was supplemented by 1 ounce (30 cc.) daily by mouth of an aqueous concentrate of rice polishings³ which provided 1,500 international units of vitamin B₁ and abundant amounts of other members of the vitamin B complex. This supplement was prescribed in order to enrich the diet with the vitamin B complex and to avoid in some measure an imbalance in the complex as a consequence of the administration of such large amounts of vitamin B₁. Some of our patients showed marked improvement with vitamin B₁ alone without this supplement. In others, on the other hand, improvement of symptoms occurred only after the supplementary vitamin B complex was taken for some time. We are unable at present to evaluate the relative contribution to the relief of pain of the different members of the vitamin B complex. It

1. This material was donated by Eli Lilly & Co.

This study was aided by a grant from the Hixon Fund. From the William G. Kerkhoff Laboratories of the Biological Sciences, California Institute of Technology.

A brief report of this work was read at the National Academy of Sciences, Washington, D. C., in April 1939. An abstract was published in *Science* (89: 439 [May 12] 1939).

2. Borsook, Henry; Daugherty, Paul; Gould, A. A., and Kremers, E. D.: The Vitamin B Complex and Functional Chronic Gastrointestinal Malfunction: A Study of Two Hundred and Twenty-Seven Cases, *Am. J. Digest. Dis. & Nutrition* 5: 246 (June) 1938.

3. This material and all the thiamin chloride used in this study were donated by the Galen Company, Berkeley, Calif.

appears that the most important contribution in this respect is the vitamin B₁ administered.

In about one third of the cases the diet was supplemented by a daily dose of a fish liver oil containing approximately 9,400 units (U. S. P. XI) of vitamin A and 1,700 units (U. S. P. XI) of vitamin D.⁴ There is no evidence in our series of cases of any therapeutic benefit from this supplement.

Patients report for treatment and observation six days a week until they have been free of pain for one month, after which they report progressively less frequently. The question of the amount of active therapy

TABLE 1.—Summary of Results in Cases of Tic Douloureux Under Observation for Fourteen Months

Result	No. of Patients
Markedly improved	9
Improved	0
Slightly improved	1
Not improved	1
Had therapeutic remission longer than any spontaneous remission in the 2 years prior to beginning of treatment	7

necessary after symptoms have disappeared will be discussed.

Only seven patients have used analgesics or sedatives, even in the earliest stages of treatment. One patient still uses phenobarbital when the pain is very severe; codeine was administered a few times to another, morphine twice to a third and salicylates infrequently to four patients.

In appraising the effectiveness of any therapeutic agent or procedure in major trigeminal neuralgia the tendency to spontaneous remission, i. e. without treatment, must be taken into account. For this reason, in summarizing the results obtained in the treatment of tic douloureux, the variety of trigeminal neuralgia with which we have occupied ourselves most, we have divided the subjects into two groups: a group of eleven patients who have been under observation for thirteen months and a group of forty-seven patients who have been under treatment and observation for from six to eight months.

Table 1 shows the results at the time of writing for the first group. The significance of the different categories is as follows: "markedly improved," the patient has had no pain or only slight soreness or hyperesthesia for two months or more; "improved," the patient is fairly comfortable but there are occasional brief twinges of moderate pain or there is still some definite soreness. The patient is able to eat, talk and sleep without discomfort or his condition is really "markedly improved" but this status has not been maintained long enough for him to be included in the latter category. The other two categories need no explanation.

Of the nine patients listed as "markedly improved" in table 1, six have maintained this condition during the last nine months without any parenteral treatment. They are taking daily by mouth 1 ounce of the liquid vitamin B complex concentrate, which supplies 1,500 international units of vitamin B₁. Three of the nine patients had relapses which were relieved within two weeks by resumption of parenteral therapy. This treatment was continued for one month after the pain had disappeared.

4. E. R. Squibb and Sons donated some of this material.

With seven of the nine markedly improved patients in table 1 the remission which occurred in the course of treatment has been longer than any occurring in the two years prior to the beginning of treatment. We feel justified, therefore, in crediting to the treatment the remission which occurred during its course.

Table 2 is a summary of the results for the larger group, who have now been under observation for from six to eight months. In the light of our experience with the group of patients in table 1, we may expect that some of those now only improved or slightly improved will later justify inclusion in a higher category. About two thirds of those improved or markedly improved have now experienced relief of pain for a longer period than in the two years prior to the beginning of treatment. One of the two patients not improved has been operated on and now has recurrence of severe pain. The second is a man 87 years old. He was operated on for pain on the right side more than twenty years ago. He has had no recurrence on this side. His present pain is on the left side. Following peripheral surgical treatment there is some paralysis of the facial muscles on this side and he is troubled by excessive saliva, which he cannot prevent from running over his semi-paralyzed lower lip. He obtains complete relief from alcohol injection of the nerve which lasts for about two years.

In one of the patients designated as markedly improved in table 1, the improvement set in only after the liver injections were begun. The slightly improved patient has been receiving liver for six months. In ten of the forty-three patients classified in table 2 as markedly improved or improved a definite change occurred after they began to receive the liver injections. It must be added that the patients comprising the group in table 2 were not given vitamin B₁ injections alone for as long a time as those in table 1. This was done to test whether the addition of the injection of liver concentrate would shorten significantly the period of

TABLE 2.—Summary of Results in Cases of Tic Douloureux Under Observation for from Six to Eight Months

Result	No. of Patients
Markedly improved	25
Improved	15
Slightly improved	2
Not improved	2
Had therapeutic remission longer than any spontaneous remission in the 2 years prior to beginning of treatment (markedly improved and improved).....	31

active treatment required. This was not the case. Our present experience is too limited for a definite conclusion on the value of the liver therapy here. The present indications are that in a minority of cases significant improvement is not obtained without liver therapy but that by this additional treatment the period in which the parenteral therapy with vitamin B₁ is required is not shortened.

There is great variation in the speed at which different patients respond to treatment. Taking all the subjects together, nine were markedly improved after one month of treatment, nine after two months and eleven after three months. In a minority of those who have become markedly better this improvement did not occur until after four to six months. We have not as yet found anything in the symptoms or clinical history from which we can predict the course of recovery of any

patient. Age, sex, severity or duration of symptoms and clinical history afford no criterion.

Two features have characterized the course of recovery in nearly every case. The first is that, after the sharp stabbing or burning pain has stopped, the patients report a persistent soreness over a fairly wide area which includes the "trigger points." Unlike the paroxysms of sharp pain, the soreness is felt most of the day. Gradually the area of soreness is reduced; the areas from which it disappears last are the trigger points. At the same time the soreness becomes less severe, is experienced for a shorter time each day and finally disappears entirely.

A second common feature in the course of recovery is that relapses occur. These become progressively less severe and of shorter duration.

Among the questions which arise, one is How permanent is the relief attained by means of this treatment? It will be at least another year before a satisfactory answer can be given. It is certain that patients will vary. It seems at present that those who respond quickly (within one month) may be maintained free from pain by taking daily 1 ounce of the concentrated liquid vitamin B complex we have been using, which provides 1,500 international units of vitamin B₁. Our present limited experience indicates that those who responded slowly will continue to need injections of large amounts (10 mg. daily) of vitamin B₁ indefinitely. The price of vitamin B₁ is continually declining, so that this need not be prohibitively costly.

Of the thirty-six patients who were markedly improved, five have relapsed after from three to nine months of freedom from pain. In four of these the severe pain was relieved within one or two weeks after resumption of parenteral treatment, after which the residual soreness gradually disappeared.

We have tested the treatment just described on four patients with sphenopalatine neuralgia (Sluder's syndrome); two of these are markedly improved and two improved.

In nine cases we have diagnosed the condition as atypical facial neuralgia. There was possibly moderate improvement in three cases and no improvement in six.

There are a number of reports in recent literature on the relief of the pain of trigeminal neuralgia following the injection of vitamin B₁. Von Lobenstein⁵ reported one case in which from six to ten intramuscular injections and two or three intravenous injections of 400 pigeon units each were given, the injections being separated by two or three days. Böhm⁶ treated four cases with approximately the same dosage for the same length of time. Freedom from pain was obtained in two and no improvement in two. Vorhaus⁷ mentioned, without any details of treatment, improvement of five cases in which recurrence followed operation. Complete relief of symptoms occurred in three and improvement in two while vitamin B₁ was still being taken. Schwochow⁸ reported improvement in cases of facial paresis with pain following injection of vitamin B₁. Molnár⁹ described one case of trigeminal

neuralgia relieved after the daily injection of 400 pigeon units for nine days. In this case the pain reappeared when the patient returned home.

We are convinced from our experience that the dosages just mentioned and the short period of treatment would have failed to bring relief in most of our cases. Further, the reports cited do not indicate how long the cases were followed. Some of these may have been similar to the nine in our series in which response occurred very quickly—within one month.

Our present series of fifty-eight patients with tic douloureux consists of forty-seven women and eleven men. All but eight are over 50 years of age; one was 21 when treatment was begun; eleven are over 70. Some have had the disease for more than twenty years. Among those who are markedly improved there are seven who are over 70.

The locus of the lesion in tic douloureux is still the subject of debate. Dandy¹⁰ is of the opinion that in many cases pathologic change of etiologic significance is demonstrable in the region of the sensory root of the fifth nerve. Lewy, Frazier and Rowe,¹¹ on the other hand, favor the corticthalamic tracts as the site of the lesion. In this connection, i. e. as to whether the lesion is peripheral or central, it is interesting to compare the results just reported with those obtained in severe alcoholic neuritis, which is an undoubted peripheral neuritis, following massive parenteral B₁ therapy. In the latter condition pain is relieved much sooner (in about ten days) than in most of our cases of trigeminal neuralgia. On the other hand the paresthesias, wrist drop and ankle drop persist for months. Recovery here often proceeds at a rate comparable to that in most of the cases just reported—e. g. if the persisting "soreness" in our cases is considered as a paresthesia.

Textbook descriptions of tic douloureux give the impression that the pain is always terribly severe. From our experience this is an exaggerated picture. The pain is always troublesome, but there are many cases in which it never attains dramatic and terrifying intensity.

There is another point which our observations indicate should be added to the usual description of this disease. It is usually stated that between paroxysms there is no pain. Many of our patients have described a postparoxysmal soreness which may persist for minutes or hours.

SUMMARY

1. Fifty-eight patients with tic douloureux have been treated with large doses of vitamin B₁ and in some cases in addition with concentrated liver extracts rich in the anti-pernicious anemia principle.

2. These patients have been under observation for from six to fourteen months. So far thirty-seven are markedly improved, fifteen improved, three slightly improved and three not improved. Of the fifty-two patients markedly improved and improved, thirty-eight had a remission in the course of and after active therapy which was longer than any spontaneous remission during the two years prior to the beginning of treatment.

3. Four patients with sphenopalatine neuralgia obtained no improvement; three patients may have had some slight improvement.

5. von Lobenstein, Hofer: Vitamin B₁ Avitaminose, ihre Beziehung zu neuritischen Affektionen und deren Behandlung mit Betaxin, München, med. Wehnschr. 83: 510 (March 27) 1936.

6. Böhm, J.: Erfahrungen mit Betaxin bei Nervenkrankheiten, Psychiat.-neurol. Wehnschr. 38: 418 (Aug. 22) 1936.

7. Vorhaus, M. G.: The Present Evaluation of Vitamin B₁ Therapy, Am. J. Digest. Dis. & Nutrition 3: 915 (Feb.) 1937.

8. Schwochow, Paul: Erfahrungen mit Betaxin und der Behandlung von Neuritiden und Polyneuritiden aller Art, München, med. Wehnschr. 84: 98 (Jan. 15) 1937.

9. Molnár, Stefan: Die Behandlung mit Vitamin B₁ bei Nervenkrankungen, Klin. Wehnschr. 16: 1022 (July 17) 1937.

10. Dandy, W. E.: Diagnosis and Treatment of the Cranial Nerves, Rocky Mountain M. J. 35: 282 (April) 1938.

11. Lewy, F. H., and Frazier, C. H.: The Disturbances of the Time Relation to Sensitivity in Major Trigeminal Neuralgia, A. Research Nerv. & Ment. Dis., Proc. 15: 497, 1935. Frazier, C. H.; Lewy, F. H., and Rowe, J. N.: The Origin and Mechanism of Paroxysmal Neuralgic Pain and the Surgical Treatment of Central Pain, Brain 60: 44 (March) 1937.

THE USE OF BULK ETHER IN
SURGICAL ANESTHESIA

THE STABILITY OF ETHER IN CORK-STOPPERED
METAL CONTAINERS

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The belief prevails that U. S. P. anesthetic ether deteriorates very quickly and is unfit for anesthesia twenty-four hours after the container is opened. In 1934 a study was reported by the Golds¹ showing that this view is based on a misconception, that certain facts concerning deterioration of ether have been misapplied in practice. It is well known that when exposed to heat, sunlight, air and certain catalytic agents ether oxidizes with the formation of impurities. However, they showed that ether fails to develop any impurities detectable by very delicate tests when the sealed metal containers in which anesthetic ether is supplied by E. R. Squibb & Sons, Mallinckrodt Chemical Works and Merck & Co., Inc.,² are opened repeatedly, stoppered with cork and kept at ordinary room temperature for weeks. The same was found to be true of U. S. P. ether (Mallinckrodt) supplied in large drums of 27 and 55 pounds.

After it had been shown that chemically no appreciable change takes place in bulk ether under these conditions, the matter was examined clinically and the results of a clinical study were reported the following year (1935) by Hediger and Gold.³ This was made in the endeavor to learn whether U. S. P. ether in bulk

with ether in that study showed that the Mallinckrodt bulk ether placed in anesthetic ether cans stoppered with cork not only remained chemically pure for a long time but was clinically indistinguishable from ether in the small sealed containers. It was pointed out that there was no basis in fact for the belief that ether spoils rapidly after the container is opened and that even several weeks later the ether in the tin cannot be distinguished from the product in the tin immediately after it is opened. It was also noted that, without the slightest risk to the patient, the cost of anesthetic ether to the hospital could be greatly reduced by the use of anesthetic ether in bulk, since such ether costs only about one fifth of that in small tins.

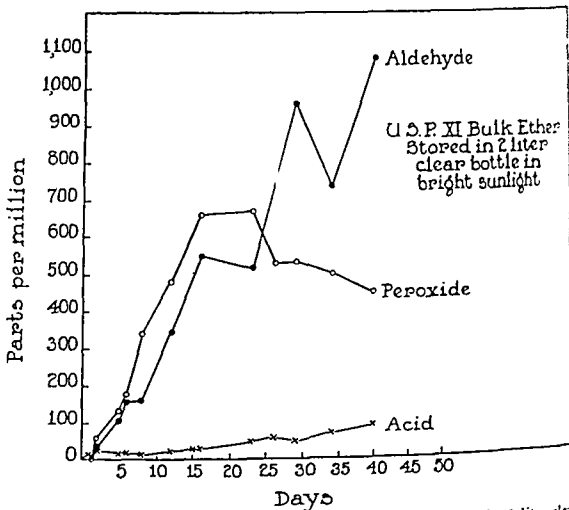


Fig. 2.—Deterioration of U. S. P. XI bulk ether stored in 2 liter clear bottle in bright sunlight.

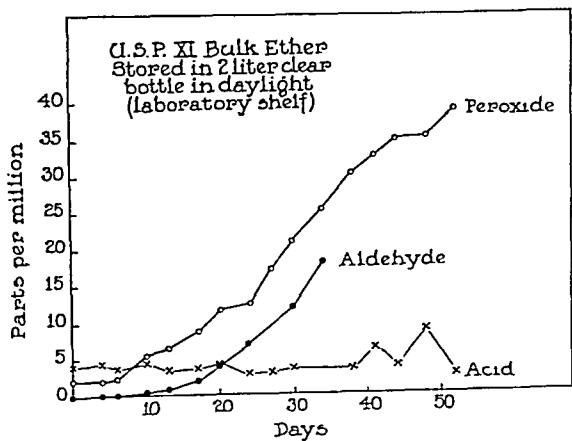


Fig. 1.—Deterioration of U. S. P. XI bulk ether stored in 2 liter clear bottle in daylight (laboratory shelf).

after its exposure to air by frequent opening and stoppering of the container with cork produced satisfactory anesthesia. The analysis of 702 surgical anesthetics

While this suggestion had not been universally received with favor,⁴ the observations were confirmed in a similar clinical comparison of bulk ether and ether in small sealed containers by Dooley and his associates⁵ in Syracuse, N. Y. They stated that from their results "it seems evident that small cans special ethers at a high cost offer no advantages over bulk ether U. S. P. either in safety or in efficiency." Morrison⁶ reported that U. S. P. bulk ether transferred to cans stoppered with cork has been used for anesthesia in a routine manner for nearly three years at the Illinois Research Hospital in Chicago with entirely satisfactory results. Similarly, bulk ether has proved entirely satisfactory and has completely replaced small can ether for surgical anesthesia at the Mount Sinai Hospital in New York during the past three years.⁷

On the labels of the older ether cans (Squibb) there appeared a statement to the effect that the ether should not be used for anesthesia after the container was opened and the ether exposed to air "for twenty-four hours or more." During recent years the twenty-four hour clause disappeared from the labels and in its place there was a less definite statement to the effect that the ether should not be used for anesthesia after the container was opened and the ether exposed to air "for

From the Department of Pharmacology of Cornell University Medical College, and the Department of Surgery of Cornell University Medical College and the New York Hospital.

1. Gold, Harry, and Gold, David: Stability of U. S. P. Ether After the Metal Container Is Opened, *J. A. M. A.* **102**: 817 (March 17) 1934.

2. These were the only brands used in our tests, although there is at present no reason for supposing that the facts do not apply to others as well.

3. Hediger, Ella M., and Gold, Harry: U. S. P. Ether from Large Drums and Ether from Small Cans Labeled "For Anesthesia": Comparison in Seven Hundred and Two Operations, *J. A. M. A.* **104**: 2244 (June 22) 1935.

4. Bulk Ether Warning, editorial, *Mod. Hosp.* **44**: 110 (March) 1934.

5. Dooley, Marion S.; Wells, C. J.; Frey, J. C.; Kress, F. H.; Galt, W. J.; Mordell, J. S.; Beuttner, J. J.; McElwain, C. E., et al.: *J. A. M. A.* **103**: 1033 (Sept. 28) 1935.

6. Morrison, S. W.: *Problems of the Hospital Pharmacist*, H. & C. **12**: 27 (June) 1938.

7. Turner, Joseph, Director of the Mount Sinai Hospital, New York.

Personal communication to the authors.

some time." On the most recent labels, which came to our attention in April 1939, however, we note that the twenty-four hour clause has been reinstated. The question of rapid deterioration of ether was reopened in a recent report by Aurelius, Herlong and Nitardy,⁸ of E. R. Squibb & Sons, who stated that their ether deteriorated rapidly when stored in cans stoppered with cork. In most of their specimens only traces of impurities developed not susceptible of detection by the U. S. P. XI tests for purity. Furthermore, no state-

taken, namely that U. S. P. ether in bulk supplied to the operating room in cork-stoppered anesthetic ether cans involves no compromise with the purity of the ether or with the safety of the patient. Nevertheless, in view of the practical importance of the matter, a program was undertaken to extend our previous work, from both the chemical and the clinical standpoint, to determine by quantitative tests for impurities the speed of deterioration of ether under a variety of conditions and to compare the merits of bulk ether

TABLE 1.—Rate of Formation of Impurities in U. S. P. XI Bulk Ether Stored Under Various Conditions

No. of Specimen	Containers	Manner of Storage*	Frequency of Testing†	No. of Days Stored	Highest Concentration of Impurities in Period of Storage, Parts per Million			Days Stored Before Impurities Appeared				Days Before U. S. P. XI Qualitative Tests Became Positive‡	
					Per-oxides	Alde-hydes	Acids‡	Peroxide		Aldehyde		Per-oxide	Alde-hyde
								Days	Amount, Parts per Million	Days	Amount, Parts per Million		
9	27 lb. drum	Refrigerator	2 weeks	64	0	0	13-19	64	0	64	0	0	0
10	2 liter amber bottle	Dark closet (room temperature)	3-4 days	63	7.1	1+	7-23	34	2.3	9	1+	0	0
11	2 liter clear bottle	Dark closet (room temperature)	3-4 days	44	13.6	10	9-29	7	2.5	9	1+	10	26
12	2 liter clear bottle	Daylight (lab- oratory shelf)	3-4 days	44	6.8	3	5-20	7	3	7	2	26	0
13	2 liter clear bottle	Daylight (lab- oratory shelf)	3-4 days	52	38.8	18	6-21	10	5.5	17	2	..	..
14	2 liter clear bottle	Bright sunlight	2-3 days	63	659	2,760	11-153	2	62	2	31	2	2
15	2 liter amber bottle	Bright sunlight	2-3 days	40	41.2	10	4-17	2	1.5	2	1	19	30

* Temperature range at place of storage: room temperature, 25-32 C.; refrigerator, 6-10.5 C.; sunlight, 26-48 C.; closet, 25-32 C.
† Most specimens were tested after the first and second day of storage, and then this schedule was followed.
‡ The figures for the acids fluctuated widely and irregularly. Only in specimen 14 do they appear to be significant, having risen more or less progressively from the sixteenth to the sixty-third day. In a typical case (specimen 10) the fourteen tests for acid in a period of fifty-seven days gave the following results: 15.6, 16.2, 13.8, 13.8, 7.8, 10.2, 18.0, 23.4, 15.6, 10.8, 7.8, 7.4, 10.2, 10.8.
§ Those which never became positive are indicated by a zero.
|| This specimen was stoppered with a glass stopper and sealed with stopcock grease. The others were stoppered with cork.

TABLE 2.—Rate of Formation of Impurities in U. S. P. XI Ether (Labeled "For Anesthesia") After the Metal Container Is Opened and Stoppered with Cork

No. of Specimen	Brand	Containers		Manner of Storage	No. of Days Stored	Frequency of Testing*	Highest Concentration of Impurities, Parts per Million		
		No. of Cans	Size				Peroxides	Aldehydes	Acids
1	Mallinckrodt	1	5 lb.	Refrigerator	58	Weekly	0	0	4
2	Mallinckrodt	1	5 lb.	Refrigerator	50†	Biweekly	0	0	6
3	Mallinckrodt	1	1 lb.	Room temperature	14‡	Biweekly	0	1	7
4	Mallinckrodt	1	5 lb.	Room temperature	75	5 days	0	0	11
5	Merck	1	5 lb.	Room temperature	59	Weekly	0	0	8
6	Merck	1	5 lb.	Refrigerator	41	Weekly	0	0	13
7	Squibb	3	1 lb.	Refrigerator	49	Weekly	0	1	9
8	Squibb	3	1 lb.	Room temperature	66	Weekly	0	0	15

* Most specimens were tested after the first and second day of storage, and then this schedule was followed.
† Ground cork placed in can.
‡ So lightly stoppered that ether evaporated.

ment was made regarding a crucial factor in the experiment, namely the type of containers in which the ether was stored. It is well known that improper containers may accelerate the oxidation of ether, and in the previous reports⁹ care was taken to emphasize the fact that the stability of ether after the container is opened and stoppered with cork applies to the containers in which the well known brands of anesthetic ether are supplied at the present time in this country. It is not possible, therefore, to know what bearing their results have on the practical aspect of the position we have

transferred to cork-stoppered ether tins with ether in small sealed metal containers in a larger series of surgical anesthetics. The results of these investigations form the subject of the present report.

CHEMICAL STUDY

1. *Methods of Testing.*—Peroxides: The method of Green and Schoetzow¹⁰ with some modifications was employed. In the early experiments absolute alcohol was used to render the aqueous solution of sodium thiosulfate miscible in ether. However, 95 per cent alcohol (U. S. P.) was found equally satisfactory, and

8. Aurelius, J. E.; Herlong, E. S., and Nitardy, F. W.: *Chemical Stability of Anesthetic Ether*, J. Am. Pharm. A. 26: 45 (Jan.) 1937.
9. Harry and David Gold,¹ Hediger and Gold.²
10. Green, L. W., and Schoetzow, R. E.: *A Method for the Quantitative Determination of Minute Amounts of Peroxides in Ether*, J. Am. Pharm. A. 22: 412 (May) 1933.

this was used in the subsequent experiments. Blank tests for peroxides were made in the case of all alcohol for each ether test. The sodium thiosulfate was standardized by the method of Wenger, Cimerman and Rzymowska.¹¹

Aldehydes: The method of Carey, Green and Schoetzow¹² with some modifications was employed. Control tests showed that we were able to detect 1 part of

TABLE 3.—Types of Operations in the Cases in Which a Mixture of Anesthetic Agents Was Used

Operation	U. S. P. XI	Small Can Ether
	Drum Ether	U. S. P. XI Labeled "For Anesthesia"
1. Appendectomy.....	148	110
2. Biliary tract.....	56	42
3. Major gynecologic.....	45	23
4. Prostate and bladder.....	12	10
5. Kidney and ureter.....	16	12
6. Stomach.....	20	15
7. Intestinal resection.....	20	8
8. Nose and throat (tonsils, adenoids, antrums, etc.).....	143	149
9. Thyroid.....	22	18
10. Exploratory laparotomy.....	17	14
11. Radical breast.....	17	12
12. Hemorrhoidectomy.....	7	21
13. Hernia.....	42	39
14. Closed and open reduction.....	26	11
15. Incision and drainage.....	44	46
16. Miscellaneous.....	136	110

acetaldehyde in 1,000,000 parts of ether. The fuchsin-sulfurous acid was prepared according to the method of the British Pharmacopoeia of 1914. If there remained a slight amber tint in the reagent it was removed by shaking for thirty seconds with 0.5 Gm. or less of animal charcoal per liter. Very little dye is removed from the reagent in this way and its value is unimpaired by this loss, since the same sample of fuchsin-sulfurous acid is used for both the standard and the test samples of ether. The primary standards were aqueous solutions of acetaldehyde, made to contain 1 Gm. of acetaldehyde in 100 cc. of distilled water. These were prepared by adding 5 cc. of pure acetaldehyde (B. P. 21 C.) from a buret and distilled water to make 25 cc. in a volumetric flask. On the basis of the specific gravity of pure acetaldehyde at 20 C., 6.4 cc. of this solution would then be diluted to 100 cc. with distilled water in a volumetric flask to make the final primary standard solution. The usual corrections for changes in volume of the acetaldehyde with temperature were made when the temperature varied significantly from 20 C. Carey, Green and Schoetzow¹² made their primary standard solutions in aldehyde-free alcohol instead of in water. The aqueous solution, however, is easier to prepare and obviates the difficulty encountered as the result of the polymerization of aldehydes in alcohol. The aqueous standard appears to remain unchanged almost indefinitely in the refrigerator. Secondary standard solutions were ether solutions of acetaldehyde. They were prepared by diluting some of the primary standard with aldehyde-free dry ether. The ether was dried by shaking for a few minutes with a few pieces of calcium chloride. Shaking for a few minutes sufficed to dissolve the primary standard. The usual secondary standard was made by diluting 1 cc. of the primary

standard to 100 cc. with the aldehyde-free dry ether, making 100 parts per million of acetaldehyde. In some instances this was further diluted as much as four times (25 parts per million) for colorimetric readings in order to bring the standard as close to the test sample as possible. The comparisons of the standard with the test solutions were made in a colorimeter rather than by a direct inspection in test tubes as in the method of Cary, Green and Schoetzow.¹² For this purpose the following mixtures were prepared simultaneously: a 5 cc. sample of secondary standard acetaldehyde in ether and 5 cc. of Schiff's reagent, and a 5 cc. sample of ether and 5 cc. of Schiff's reagent. Each mixture was placed in a 50 cc. glass-stoppered flask and agitated with a swirling motion for twelve minutes. The ether was carefully decanted and the two specimens of 5 cc. of reagent containing all the developed color were immediately compared in a colorimeter. The color development in Schiff's reagent with aldehydes is not strictly proportional to the concentration. Data relating color depth to concentration of aldehyde have been published by Bonis,¹³ from which a calibration curve was prepared and used for making the necessary minor corrections in the figures obtained by direct colorimeter readings.

Acids: Five cc. of 95 per cent alcohol was placed in a 50 cc. glass-stoppered flask. To this was added 2 drops

TABLE 4.—Types of Operations in the Cases in Which Ether Was the Sole Anesthetic Agent

Operation	U. S. P. XI	Small Can Ether
	Drum Ether	U. S. P. XI Labeled "For Anesthesia"
Tonsillectomy.....	100	99
Appendectomy.....	19	10
Circumcision.....	33	13
Closed reduction.....	2	2
Open reduction.....	2	9
Incision and drainage of abscess.....	8	10
Mastoidectomy.....	15	0
Cholecystectomy.....	4	0
Exploratory laparotomy.....	0	1
Dilation of rectal sphincter.....	1	0
Osteotomy.....	2	6
Prostatectomy.....	1	5
Ventriculogram.....	3	4
Hernia.....	5	2
Adenoidectomy.....	6	3
Cystoscopy.....	2	2
Craniotomy.....	2	0
Splenectomy.....	1	0
Miscellaneous.....	39	26

TABLE 5.—Distribution of Cases of Vomiting During the Induction and Maintenance Stages of Anesthesia

Type of Anesthesia	Number of Cases
All anesthetics.....	79
Mixed anesthetics.....	56
Small can ether U. S. P. XI (mixed anesthesia).....	27
Drum ether U. S. P. XI (mixed anesthesia).....	26
Small can ether U. S. P. XI alone.....	11
Drum ether U. S. P. XI alone.....	12

of bromthymol blue and enough 0.01 molar sodium hydroxide¹⁴ to produce a neutral green color. Then 25 cc. of the ether sample was added, the flask was stoppered, and after thorough shaking the mixture was

11. Wenger, P.; Cimerman, C., and Rzymowska, C. J.: Contribution à l'étude microanalytique du potassium, *Mikrochemie* 20:1, 1936.
12. Carey, M. W.; Green, L. W., and Schoetzow, R. E.: A Method for the Determination of Minute Amounts of Aldehydes in Ether, *J. Am. Pharm. A.* 22:1237 (Dec.) 1933.

13. Bonis, M. A.: Méthodes officielles pour l'analyse des dérivés alimentaires, *Annales Falsif.* 2 (appendix): 13, 1909.
14. The solution of sodium hydroxide was originally made up 24 cc. 0.1 molar. It was titrated against 0.01 molar hydrochloric acid every week, and the change in molarity of sodium hydroxide was taken into account in the calculation.

titrated with 0.01 molar sodium hydroxide to the appearance of a blue color. The amount of acid in the ether was then calculated as acetic acid.

2. *Kinds of Ether and Methods of Storage.*—Two types of ether were employed in these experiments: 1. Ether U. S. P. XI labeled "for anesthesia" (Mal-

TABLE 6.—*Postoperative Complications in Patients Anesthetized* with U. S. P. XI Drum Ether and U. S. P. XI Small Can Ether Labeled "For Anesthesia"*

Complications	U. S. P. XI Drum Ether	U. S. P. XI Small Can Ether Labeled "For Anesthesia"
Total number of post-operative pulmonary complications.....	18	24
Total number of deaths.....	12	13
Causes of death.....	1. Shock following lobectomy 2. Shock and internal hemorrhage 3. Internal hemorrhage 4. Peritonitis and shock 5. Peritonitis 6. Peritonitis 7. Peritonitis 8. Pulmonary embolus 9. Pulmonary embolus 10. Pulmonary embolus 11. Pneumonia 12. Carcinomatosis	1. Pulmonary emboli and peritonitis 2. Peritonitis and pneumonia 3. Purulent meningitis 4. Peritonitis and uremia 5. Hemorrhage 6. Heart failure 7. Heart failure; hemophilia 8. Peritonitis and hemorrhage 9. Carcinomatosis 10. Intestinal gangrene 11. Intestinal hemorrhage 12. Bronchopneumonia; nephrosis 13. Peritonitis and bronchopneumonia
Nature of nonfatal pulmonary complications	1. Bronchitis with partial atelectasis 2. Bronchiectasis? 3. Pulmonary edema 4. Pulmonary edema 5. Atelectasis 6. Atelectasis	1. Bronchopneumonia 2. Bronchopneumonia 3. Bronchopneumonia 4. Bronchopneumonia 5. Pneumonia 6. Pneumonia 7. Pneumonia 8. Pneumonia 9. Bronchitis 10. Bronchitis 11. Pulmonary infarct

* In some cases only ether was used; in others, mixed anesthetic agents.

linckrodt, Squibb, Merck) was obtained in the 1 to 5 pound tins in which it is supplied on the market. The metal caps were removed and the cans were stoppered with ordinary cork. 2. U. S. P. XI ether was obtained in bulk in a 27 pound drum (Mallinckrodt).

These ethers were tested when first opened and then they were divided into groups and stored in various ways in order to study the effect of the following factors on deterioration:

1. Effect of temperature (cans in refrigerator and at room temperature).

2. Effect of cork (1 Gm. of ground cork introduced into the ether can).

3. Effect of access of air (can stoppered so lightly—only by force of the weight of the cork—that evaporation of the ether took place fairly rapidly).

4. Effect of repeated opening and cork stoppering of the container.

5. Effect of clear and amber colored bottles (stored in dark laboratory closet).

6. Effect of daylight (stored in clear and amber colored bottles on a laboratory shelf).

7. Effect of bright sunlight (stored in clear and amber colored bottles on window sill exposed directly to bright sunlight).

3. *Results of Chemical Tests for Deterioration.*—The accompanying charts show the type of curves obtained when ether is stored under unfavorable conditions which promote deterioration.

The essential details of the chemical results with all the specimens are presented in tables 1 and 2. Sunlight is unfavorable to the preservation of ether. When ether was exposed to bright sunlight in an amber bottle traces of impurities appeared on the second day, but the increase was fairly slow so that the ether was negative by U. S. P. XI qualitative tests for purity for more than two weeks. In the clear bottle, however, the formation of impurities was very much more rapid, the ether becoming positive for impurities by the U. S. P. XI tests by the second day. All the ether stored in bottles in the warm room developed impurities, but in the absence of light the deterioration was very much slower than is commonly supposed. In a dark closet a week passed before even traces of impurities appeared; in one case (clear glass) it was about three weeks before the ether was unfit by the U. S. P. XI tests, and in another case (amber glass) the impurities never became positive by the U. S. P. XI tests even after sixty-three days of such storage.

Bulk ether U. S. P. XI (Mallinckrodt) in a 27 pound drum which was opened and stoppered repeatedly failed to develop any impurities in the course of sixty-four days.

Among twelve specimens of ether U. S. P. XI labeled "for anesthesia," stored in the cans in which they were obtained, ten developed no impurities in from forty-one to seventy-five days. The other two showed only about one tenth of the amount of aldehyde detectable by the very delicate U. S. P. XI tests for impurities after storage for fourteen and forty-nine days respectively.

TABLE 7.—*Comparison of Incidence of Satisfactory and Unsatisfactory Anesthetics in Cases in Which U. S. P. XI Drum Ether Was Used with That in Cases in Which Small Can Ether U. S. P. XI Labeled "For Anesthesia" Was Used*

	U. S. P. XI Drum Ether		Small Can Ether U. S. P. XI Labeled "For Anesthesia"	
	Number	Per Cent	Number	Per Cent
Ether alone (446 cases)				
Total cases.....	249	....	197	....
Satisfactory.....	212	85.1	163	82.8
Unsatisfactory.....	37	14.9	34	17.2
Mixed anesthesia (1,419 cases)				
Total cases.....	781	....	638	....
Satisfactory.....	673	86.2	538	87.5
Unsatisfactory.....	108	13.8	80	12.5
All anesthesia (1,865 cases)				
Total cases.....	1,030	....	835	....
Satisfactory.....	885	85.8	721	86.3
Unsatisfactory.....	145	14.2	114	13.7

All cans were opened many times for the removal of samples and again stoppered with cork. The ether in anesthetic ether cans failed to develop significant impurities whether the ether was stored in the refrigerator or at room temperature. Ground cork in the ether can did not promote deterioration after storage for fifty days. The ether in the can which was very lightly stoppered evaporated in about two weeks, but no significant deterioration was present as long as the ether lasted.

CLINICAL STUDY

Methods.—We have already referred to the clinical study by Hediger and Gold³ in 1935. The reason for that investigation was the prevalence of a notion that some change may take place in ether, not detectable chemically, which may render it unfit for anesthesia. The clinical study was carried out with the "blind test," a simple expedient which insures a record free of the influence of subconscious bias. This technic is especially necessary in the case of a clinical study on ether, in view of the strong devotion of anesthetists to one or another of the favored brands of anesthetic ether. Ether was supplied to the operating room in small cans stoppered with cork, numbered consecutively and bearing a uniform label. A detailed record on a special chart was made by the anesthetist. This included an account of those factors with respect to which the different kinds of ether were to be compared: coughing, excessive mucus, undue struggling, vomiting, cyanosis, signs of collapse, unduly prolonged induction stage, difficulty in obtaining sufficient anesthesia or relaxation, and postoperative complications. Criteria were formulated by means of which the anesthetics were also labeled "satisfactory" or "unsatisfactory." These designations expressed a judgment on the part of the anesthetist concerning factors which might reasonably influence the character of the anesthesia, such as the temperament of the patient, the character of the operation and the type of preliminary medication. This record, except for the postoperative complications, was made by the anesthetist at the time of the operation and in all cases without knowledge of the identity of the specimen. The source of the ether remained unknown also to those who analyzed the results until the analyses were completed and the results recorded. In that study on 702 surgical anesthetics it was shown that anesthetists could not distinguish between the anesthetics with ether taken from one-fourth pound freshly opened tins and those with ether taken from a large drum which had been opened repeatedly, both types of ether, of course, being chemically pure.

The clinical study has now been extended to include nearly 2,000 additional surgical anesthetics. The results are presented in tables 3 to 7. The ether in small sealed tins was that of Squibb, Merck and Mallinckrodt. The bulk ether was obtained from Mallinckrodt in 27 pound drums. A large number of small emptied ether cans labeled "for anesthesia" of the type in which anesthetic ether is supplied by Squibb, Merck and Mallinckrodt were assembled. These were rinsed with bulk ether and then filled with bulk ether, stoppered with cork and supplied on demand to the operating room.

Results of Clinical Comparison.—The same general types of operations were represented in the two groups (tables 3 and 4). The cases of vomiting during induction and maintenance were essentially similar in distribution (table 5) with the two kinds of ether. The postoperative pulmonary complications were also similar with the two types of ether (table 6). In table 7 it may be seen that among 1,030 anesthetics with bulk ether 85.8 per cent were satisfactory, and among 835 anesthetics with ether from small cans 86.3 per cent were satisfactory.

These results, therefore, confirm our previous observations, showing that ether in bulk from a metal container which has been opened many times and stoppered with cork remains chemically pure over periods of many

weeks and produces anesthesia that is in no way distinguishable from that with ether from a small sealed metal container.

COMMENT

In the present study we have secured data concerning the speed of deterioration of ether under unfavorable circumstances and concerning its behavior under favorable conditions. Ether does not deteriorate nearly as quickly as is commonly supposed. If the sealed metal container in which anesthetic ether is supplied is opened and the container stoppered with cork repeatedly, the ether remains pure for many weeks. Since there is always the possibility that some of the cork may drop into the ether, we tested the effect of cork in ether and found that ordinary laboratory cork has no appreciable influence on the speed of deterioration of ether. In view also of the fact that a can might accidentally be left lightly stoppered and the access of air in that way accelerate deterioration, we investigated that matter also and found that under those conditions the ether evaporates but remains pure to the last drop (at least two weeks).

In a study of nearly 2,000 surgical anesthetics in which ether was employed, we have found that the ether taken from these cork-stoppered anesthetic ether cans is indistinguishable clinically from ether in the sealed metal containers.

In our experience with this matter we have learned that it is extremely difficult to avoid the confusion of issues. Although we believe that the supposed danger of traces of impurities in ether is not based on sound evidence, we wish to emphasize that we do not recommend the use of impure ether. We have simply shown that, when pure anesthetic ether is kept in an anesthetic ether can which is opened and stoppered with cork repeatedly, the ether remains pure. It appears to be the experience of ether manufacturers that the behavior of ether is capricious and that for reasons which they cannot discover ether will sometimes undergo deterioration inside the sealed metal containers. There is no reason for believing that the caprice of ether with regard to deterioration in this way is influenced by opening the sealed container and stoppering it with cork.

CONCLUSIONS

In view of the foregoing facts we reaffirm the conclusions reached in our previous studies. Hospitals may use ether in bulk for anesthetic purposes. This ether can be transferred from a 25 pound drum, either directly by a funnel or by a copper siphon arrangement, to small emptied anesthetic cans which can then be stoppered with cork. Such ether in a drum can be kept for at least a month without developing impurities. Where less ether is used, the small quarter pound tins can be filled from 5 pound cans instead of 25 pound drums. A considerable saving in the cost of ether to the hospital can be effected in that way. Some outstanding hospitals in the United States are now using such bulk ether for surgical anesthesia. This practice involves no compromise with the purity of the ether or the safety of the patient.

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Prophylaxis of Cholera.—Prevention of cholera may be divided into three subsections: (a) the use of vaccines; (b) the use of bacteriophage; (c) general methods including quarantine measures.—Scott, H. Harold: *A History of Tropical Medicine*. Baltimore, Williams & Wilkins Company, 1939.

SOME SPECIFIC MEASURES IN THE
TREATMENT OF RHEUMATOID
ARTHRITIS

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Within the past decade serious investigators of arthritis have been unanimous in emphasizing the fact that the foundation for the successful management of chronic arthritis, like that for tuberculosis, is a broad and comprehensive program of treatment. Many allied therapeutic measures, headed by the judicious application of rest, are required. From time to time, nevertheless, newer modes of therapy are brought forth; they have their ardent exponents and, later, equally earnest and capable antagonists, and for varying periods each enjoys a vogue as a possible "specific" treatment for rheumatoid arthritis.

These measures have in the main been difficult to evaluate. One reason for this difficulty is the lack of control studies by those initiating a new form of treatment in arthritis. The fact that rheumatoid arthritis may be a self-limited disease, certainly one subject to spontaneous remissions, further complicates any individual physician's efforts to achieve balanced judgment with regard to the use of new drugs. On the contrary, disappointment with a new measure may engender distrust of all therapeutic efforts.

But newer measures of treatment in rheumatoid arthritis continue to enjoy increasing application, once they have gained the momentum of active use. More often than not they are kept alive by intensive campaigns of advertising emanating from commercial pharmaceutical houses. Often glowing results of the use of these new measures are quoted out of their context. The "blurbs," so to speak, focus on the drug, not on the drug in relation to the entire medical regimen employed. For all these reasons the general practitioner, particularly, has found himself at a disadvantage in choosing those resources most likely to be of value.

Among such therapeutic measures the effectiveness of which, we feel, requires evaluation at this time are colloidal sulfur, vaccines, sulfanilamide, fever-inducing machines and, of more recent vintage, gold salts.

In order to consolidate the experience with these forms of treatment a questionnaire was sent to the 178 members of the American Rheumatism Association, comprising physicians all over the United States particularly interested in rheumatic disease. Doubtless this cumulative experience constitutes an excellent cross section of clinical trial and serves as a touchstone to our own clinical experience.

One hundred and eleven replies to the questionnaire were received; ninety-two answered in considerable detail regarding the value of these therapeutic measures. This group includes physicians or clinics who treated 200 or more patients with any given modality, as well as those who treated only a few patients and thereby gained some clinical impressions as a guide. The other nineteen who replied stated that they could not furnish the data requested, either because they had not sufficient clinical experience, being interested only academically in the problem of arthritic disease, or because they

were affiliated in the management of the same group of patients concerning whom their associates reported to us.

For the purpose of the present note, detailed statistical analysis of the data is neither feasible nor desirable. In general, the answers regarding the value of any given measure ranged preponderantly "for" or "against." We feel that the material here collected is a good indicator of the present status of each mode of therapy to be discussed. It may well serve as a guide to the perplexed physician who seeks unbiased knowledge on the value of certain specific forms of treatment he would like to include in his armamentarium.

COLLOIDAL SULFUR

A purely empiric notion led originally to the trial of sulfur in the treatment of arthritis. The experience with it has been extensive and the views of various observers who have reported on its value have been extremely contradictory. A review of the literature is unnecessary here, because it is available in a report of the Council on Pharmacy and Chemistry of the American Medical Association.¹ This report constitutes a thorough, unbiased and critical evaluation of the many isolated reports on the subject.

In 1937 one of us (H. M. M.) stated that sulfur injections proved entirely ineffective in our experience.² And the answers to our questionnaire essentially parallel and substantiate the former conclusion. For, as the summary of the data from the questionnaires indicates, more physicians who had given sulfur a trial have abandoned its use than are continuing it (thirty-six to twenty-two). The more extensive the trial, the fewer the favorable impressions of its use. Moderate users, who constitute the majority of reporters, found it "of no benefit" in arthritis, and (in a ratio of seven to one) report it "disappointing," "overrated" or "of no use." The dosage employed by both those who continued and those who discontinued its use was essentially the same. The occasional favorable reports appeared to be more enthusiastic than critical.

It is also significant, as the report of the Council on Pharmacy and Chemistry brought out, that none of the leading arthritis clinics which have given sulfur therapy a trial are continuing its use; all have abandoned it.

Most illuminating are the detailed metabolic studies of Freyberg and his associates,³ which emphasize the total lack of rationale in the therapeutic use of sulfur. Studying a group of patients with rheumatoid arthritis they could find no deviation from normal in the metabolism of sulfur. They showed that the concentration of sulfur in the blood of rheumatoid arthritic patients is essentially the same as in normal controls. They demonstrated further that, if a deficiency of sulfur exists in the tissues, this deficiency cannot be remedied by administration of sulfur, since the drug is too rapidly and almost quantitatively excreted after parenteral injection or when given by mouth.

How, then, explain the favorable therapeutic results reported by some observers? Improvement following administration of sulfur may likely have been a coin-

1. Colloidal Sulfur in the Treatment of Chronic Arthritis, Report of the Council on Pharmacy and Chemistry, J. A. M. A. 111:1657 (Oct. 29) 1938.

2. Margolis, H. M.: The Treatment of Atrophic Arthritis, in Clinical Reviews of the Pittsburgh Diagnostic Clinic, New York, Paul B. Hoeber, Inc., 1937, p. 255.

3. Freyberg, R. H.; Block, W. D., and Fromer, M. F.: Sulfur Metabolism and the Effect of Sulfur Administration in Rheumatoid Arthritis, J. A. M. A. 115:1063 (Sept. 9) 1939.

cidence and not attributable to the drug. There is no questioning the psychologic effect of an injection—of any type of injection—on patients with arthritis. The beneficial effect that is ascribed to sulfur is probably to be attributed either to a favorable psychogenic influence of the injections or to the well known tendency to spontaneous temporary remission in the severity of arthritic manifestations.

VACCINE THERAPY

Various reports in medical literature can easily be assembled to support a brief either for or against the value of vaccine therapy in atrophic arthritis. The very number of vaccines for rheumatoid arthritis so highly lauded by their individual sponsors should be sufficient proof, however, that none are specific.

Despite an extensive experience with vaccines, Stainsby and Nicholls⁴ were thoroughly disappointed in their results. Jordan⁵ emphasized the need for controlled investigation. He deprecated the routine use of vaccine with the "implication of certain cure." Only recently, the first controlled study on the value of vaccines and injections in the treatment of arthritis was presented by Sidel and Abrams,⁶ who found that, while vaccine therapy is "beneficial" in 68 per cent of cases, sterile saline solution, similarly injected, is equally "beneficial" in 72 per cent.

Our own observations indicate that the promiscuous injection of vaccine in atrophic arthritis has probably caused more harm than good. There is little exact knowledge of how vaccines act in these cases. The experimental facts on which the various forms of vaccine therapy are based cannot be applied, in toto, clinically. Nothing could be more convincing of how sadly we are lacking in knowledge concerning the type and manner of vaccine therapy than the extremely conflicting practices that have been advocated by various writers. "There are investigators who report a large percentage of cures by giving millions of streptococci intravenously. Others, equally sincere, report similar results when the equivalent of less than one organism is used. There are ardent advocates of subcutaneous and of the intravenous method of inoculation. Stock vaccines are championed by some and decried by others. Agglutination, complement fixation and skin reactivity have all been defined as guides to diagnosis and therapy. Constitutional reactions are believed to be desirable or harmful, depending on the investigator."

From time to time we have studied various methods of vaccine therapy. Undoubted clinical improvement, attributable primarily to vaccine, is rarely observed. We have seen some unfavorable reactions. It is conceivable that a patient highly sensitive to streptococci can be made worse by subcutaneous injection of large doses of vaccine. Also sensitization may possibly be created or increased by long continued administration of vaccine into the skin. Acutely ill patients are least likely to tolerate vaccine therapy. And, if their general resistance is low, a stubborn bombardment with vaccines may place them in serious jeopardy.

In the light of these facts let us analyze the clinical impressions of the value of vaccines in rheumatoid arthritis, elicited by our questionnaire:

Fifty-nine physicians stated that they used vaccines; twenty-four did not; eight used them only rarely; fourteen had abandoned their use. Many definitely stated that they employed vaccines much less frequently now than before. About 60 per cent of users believe vaccines are beneficial to a degree. The consensus, however, indicated that fewer than 50 per cent of patients derived benefit from their use, these being particularly in the early stage. The extent of usage varies considerably, from some clinics where most atrophic patients are vaccine treated, to others where only the "get nowhere" patients are so treated. Most popular are the streptococcus vaccines (used by fifty physicians), next the autogenous (forty-one). Most workers emphasize the desirability of avoiding reactions. Of those who had not found vaccines of any benefit, most had given them extensive trial, had employed predominantly the streptococcal variety, and attributed whatever benefit was ascribed to vaccines by others largely to a psychogenic influence.

Our own experience with various types of vaccines long ago impressed us with the conclusion that, in the occasional case in which some benefit is apparently derived, it is largely attributable to a purely psychic effect. Having concluded that vaccines do not fundamentally alter the course of the disease, we have entirely abandoned their use in arthritis. The impression gained from the questionnaire, as well as the results of Sidel and Abrams, reassure us that we have sacrificed very little.

Surely vaccine therapy is anything but a panacea. Its effect is not specific and its value is quite limited. It may impress the patient that something tangible and specific is being done, but that is not true. It gives him a false sense of security on which he may rely too much. If the periodic injection of vaccine is condoned on the score that it affords the physician an opportunity of seeing his patients often and for long periods and thus permits the application of other, important, therapeutic measures, it would be well, then, that the physician consciously recognize this fact. But too often the injection of vaccine becomes a fetish for the physician as well as the patient, and other measures are then altogether neglected.

FEVER THERAPY

When physical means became available for the administration of fever therapy, it was hoped that fever-inducing machines might be applicable in the treatment of rheumatoid arthritis. Extensive trial of this form of treatment was therefore carried out. Estimates of its effectiveness in atrophic arthritis have varied, depending to an extent on the enthusiasm of the observer. In general, the experience of others with this type of therapy has paralleled our own.

In 1932 in the treatment of thirteen patients with rheumatoid arthritis we employed hyperthermia induced by a high frequency current. Elevations of temperature to from 103 to 104 F. were induced and maintained for periods of four to six hours, a series of four to six such treatments being given at weekly intervals. Seeking an opportunity for demonstrating the maximum benefit available from fever therapy, we selected patients with the disease of relatively short duration, with pathologic changes confined largely to periarticular structures and, generally, with minimal degrees of bony change or deformity.

4. Stainsby, W. J., and Nicholls, E. E.: Results of Treatment in Rheumatoid Arthritis, with Reference to Foci of Infection and Streptococcus Vaccine, *J. Lab. & Clin. Med.* **18**: 881 (June) 1933.

5. Jordan, E. P.: Critical Evaluation of Vaccine Therapy in Rheumatism, *J. A. M. A.* **109**: 1444 (Oct. 30) 1937.

6. Sidel, Nathan, and Abrams, M. I.: Treatment of Chronic Arthritis: Results with Saline Injections Used as Controls for Vaccine Therapy, read before the sixth annual meeting of the American Rheumatism Association, St. Louis, May 15, 1939, to be published.

The initial improvement that generally occurred immediately after a treatment was often remarkable. Stiffness and soreness generally disappeared; the pain was abated, and frequently periarticular swelling disappeared completely. Naturally, greater freedom of motion and an increased sense of well-being resulted. It was disappointing, however, that those gains were only temporary. Frequently within forty-eight hours, but practically always within a week, the condition of the joints resumed the status preceding the fever therapy-session. All of the previous symptoms returned. Such improvement in and recurrence of symptoms followed each session of fever therapy. We were equally disappointed not to find any cumulative beneficial action from the series of treatments administered. Observing these patients for months afterward, we were forced to conclude that there was nothing to recommend this form of treatment for rheumatoid arthritis.

Shortly afterward, Nicholls, Hansson and Stainsby⁷ reported their results on the treatment of rheumatoid arthritis with hyperthermia. With twelve patients so treated their results coincided with ours in every respect. They too observed temporary relief of symptoms but not lasting benefit. They emphasized the fact that this form of therapy entails not only a trying ordeal for the patient but also some risk of complications. They concluded that their results did not justify continuing the employment of fever therapy in rheumatoid arthritis. Recently Krusen and Elkins⁸ indicated that 70 per cent of patients with infectious (rheumatoid) arthritis treated by fever therapy exhibited little or no improvement. For the 30 per cent who were improved, the therapeutic program included, besides fever therapy, a well rounded medical regimen. The evidence in favor of fever therapy alone in this condition is obviously wanting.

The results reported through our questionnaire confirm the impressions just described. Thus of ninety-two physicians reporting, 57 use, or have used, fever therapy as a modality in the treatment of rheumatoid arthritis. Good results were reported by very few; poor results were preponderant in the ratio of two to one. Reiterated in the replies were the dangers of fever therapy for all but the most robust patients. Two fatalities and two near fatalities were encountered. The next most frequent comment was the fact that whatever benefit results from fever therapy is only temporary, relapses usually occurring. The latter was the most frequent reason given for abandoning this type of treatment. The occasional good results reported have been those among young subjects with early atrophic arthritis or among those suffering from gonorrheal arthritis.

These answers indicate that fever therapy is not for the general run of arthritic patients. At present this measure holds little promise of benefit for the patient with rheumatoid arthritis. A combination of induced fever and some form of chemotherapy may possibly yield more worth while results in the future.

SULFANILAMIDE

In view of the possibility that a hemolytic streptococcus infection is related to rheumatoid arthritis, it seemed logical to try the effect of sulfanilamide in this condition. We administered this drug in adequate doses

to a small group of patients with active rheumatoid arthritis. The results were entirely disappointing. Not only were beneficial effects not noted but the reactions from the drug were for the most part disturbing, if not serious. The use of sulfanilamide in rheumatoid arthritis was therefore discontinued. Reports of other observers confirm the impression we had gained. Swift, Moen and Hirst,⁹ for example, found sulfanilamide valueless in the treatment of rheumatic fever, and Coggeshall and Bauer,¹⁰ treating ten patients with rheumatoid arthritis with large doses of sulfanilamide, could find no beneficial effect either on the clinical course of the disease or on the sedimentation rate. This contrasted with the beneficial effects observed in the treatment of gonorrheal arthritis, in which there were both clinical improvement and reduction of the rate of sedimentation.

Sulfanilamide was tried by forty-four of the ninety-two physicians who answered our questionnaire. The opinions were practically unanimous in condemning this drug for the treatment of atrophic arthritis. It is clear that with present methods of administration sulfanilamide has no therapeutic value in this disease.

GOLD SALTS

Gold salts, first recommended for use in arthritis by Forrestier, in France, have been employed rather widely in England also and to a lesser extent in this country. Its mode of action in arthritis is unknown. It is certainly not a cure-all. Its use is sometimes attended by moderate, even serious, reactions. But the possible importance of gold therapy in the therapeutic armamentarium for this difficult disease is enthusiastically attested by those with large experience in its use, even those who are most critical in evaluating their results. As Hench and his associates¹¹ have pointed out: "The curve of acceptance of most 'new' treatments for arthritis that are destined to be discarded rises rather rapidly, reaches its peak in about three to five years, then falls as adverse reports begin to outnumber the optimistic ones. Finally, use of the treatment in any significant degree dies out after about eight to ten years. . . . It therefore seems significant that the curve of acceptance of chrysotherapy is still rising after ten years of use." In Europe, where the treatment of rheumatoid arthritis with gold salts is receiving its most extensive trial, under the auspices of critical observers, the impression is gaining ground that this drug represents a distinct advance in treatment.

There are, however, serious obstacles at present to its widespread use, the most important obstacle being the toxicity of gold compounds. We feel, nevertheless, that the subject of chrysotherapy deserves consideration at this time. This topic, which has received such merited comment in the European literature, has also been accorded favorable attention in recent American publications.¹² If our impression is correct, chrysotherapy will

9. Swift, H. F.; Moen, J. K., and Hirst, G. K.: The Action of Sulfanilamide in Rheumatic Fever, *J. A. M. A.* **110**: 426 (Feb. 5) 1938.

10. Coggeshall, H. C., and Bauer, Walter: The Treatment of Gonorrheal and Rheumatoid Arthritis with Sulfanilamide, *New England J. Med.* **220**: 85 (Jan. 19) 1939.

11. Hench, P. S.; Bauer, Walter; Dawson, M. H.; Hall, Francis; Holbrook, W. P., and Key, J. A.: The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1937, *Ann. Int. Med.* **12**: 1005 (Jan.) 1939.

12. Key, J. A.; Rosenfeld, Herman, and Tjoflat, O. E.: Gold Therapy in Proliferative (Especially Atrophic) Arthritis, *J. Bone & Joint Surg.* **21**: 339 (April) 1939. Snyder, R. G.; Traeger, C. H., and Kelly, L. Moynce: Gold Therapy in Arthritis: Observations on 103 Cases Treated with Gold Sodium Thiosulphate and Auroclon, *Ann. Int. Med.* **12**: 1672 (April) 1939.

7. Nicholls, E. E.; Hansson, K. G., and Stainsby, W. J.: Treatment of Rheumatoid Arthritis with Hyperthermia Produced by a High Frequency Current, *J. Bone & Joint Surg.* **16**: 69 (Jan.) 1934.
8. Krusen, F. H., and Elkins, E. C.: Fever Therapy by Physical Means, *J. A. M. A.* **112**: 1689 (April 29) 1939.

be discussed more prominently in the future. The virtues of chrysotherapy are also due to be aired soon through pharmaceutical notices. In one way or another the physician will be seriously tempted to adopt this "newer," promising way of treating arthritis. In order that he may not plunge carelessly and indiscriminately into employment of chrysotherapy, the following account of some present day knowledge on the subject is thought to be in order:

The most comprehensive study of every phase of chrysotherapy in arthritis, including its toxic reactions, is that of Hartfall, Garland and Goldie,¹³ who reviewed their results of treatment in 900 cases. No one who attempts to treat rheumatoid arthritis with gold compounds should fail to review this report with the greatest care.

In any consideration of gold therapy, serious thought must be given to the danger of toxic reactions, which constitutes the most serious obstacle to the widespread adoption of this promising therapeutic measure. The therapeutic use of gold compounds is occasionally attended by serious complications such as liver and renal damage, certain blood dyscrasias and dermatitis, some of which end fatally. Unfortunately, we have no way at present of determining which individuals are hypersensitive to the drug. Patients with such an idiosyncrasy to gold may contract a serious reaction after receiving the very first dose, regardless of its size. Yet these toxic reactions are not entirely unavoidable; to an extent, at least, the frequency of serious reactions may be greatly reduced. It appears that, by carefully modifying dosage and the method of administration, the mortality from toxic reactions of gold can be reduced. The fact remains, however, that any drug, no matter how useful but potentially capable of inducing fatal reactions, must be employed with the utmost reserve.

Aside from the fatal reactions induced by gold compounds, other toxic manifestations, appearing in a great variety of forms, develop not infrequently. In the series of 900 cases reported by Hartfall, toxic phenomena of greater or lesser severity were exhibited by 42 per cent of the cases, and in 35 per cent of these the reactions were more than trivial.

A variety of preparations of gold have been employed. In this country gold sodium thiosulfate and aurothiomalate of sodium have been the preparations most readily available and most commonly used. In our earlier experience we employed gold sodium thiosulfate intravenously. During the past two years we have employed aurothiomalate of sodium by intramuscular injection.

When the published results of gold therapy are analyzed, it becomes apparent that this is one of the most satisfactory adjuncts in the treatment of arthritis yet devised. Ninety-four per cent of Copeman and Tegner's¹⁴ series showed a favorable response to treatment. In Hartfall's¹³ series of 900 cases 67 per cent of the patients with rheumatoid arthritis who were able to complete the prescribed course of treatment were markedly improved or "cured" and a further 19 per cent showed some improvement, a total of 86 per cent. These clinicians "firmly believe that rheumatoid arthritis, if seen in its early stages, can be cured by gold, and that

there are few, if any, cases of the disease that cannot be improved to some extent."

Only twenty-six of ninety-two physicians who answered our questionnaire had used gold salts in the past or are using them at present. Most of these men are fearful of their use. They report reactions with approximately the same frequency as was reported from Europe: 10 per cent mildly toxic reactions, 25 per cent moderately severe reactions, 0.8 per cent fatalities. Of this group of twenty-six American physicians reporting on gold salts only one reported a fatality, that from aplastic anemia. The hazard of toxic reactions from gold is implied, however, in the terse summary of one clinician: "used it once; never again." Most present users—and these have used it in from twenty-five to 200 cases—are enthusiastic, believing gold salts to be "the best single therapeutic measure to date" in the treatment of atrophic arthritis as measured both by clinical improvement and by definite decrease in the sedimentation rate. The consensus, however, seems to be that the results obtained from the use of gold salts to date are not sufficient to justify the risk involved.

Our own results with gold therapy in fifty-one cases of rheumatoid arthritis have in general been very satisfactory. The series is too small for detailed analysis of the degree of improvement. Nor were these patients treated with gold alone. Yet it is our present impression that chrysotherapy contributed to inactivating the arthritis more often, more decisively and more promptly than any other adjuvant measure of therapy we had previously employed.

Although we feel that gold salts represent a most useful adjunct in the treatment of atrophic arthritis, there are good reasons for not recommending their more general adoption at this time. We feel that the potentialities for serious harm must be considered. Patients presenting the slightest evidence of renal or hepatic insufficiency or a tendency to purpura or leukopenia should be rigorously excluded from chrysotherapy. Nor should the drug be employed for patients who have chronic cutaneous disorders, particularly eczema. It is, moreover, too early to appraise the definitive place of gold therapy in rheumatoid arthritis. Undoubtedly the practitioner who is impressed with the glowing reports on the value of gold therapy to the point of substituting it for a vaccine or sulfur preparation as a specific for arthritis has pitfalls before him. It would be well to remember that in using this modality one assumes the serious responsibility that goes with the use of a potentially dangerous drug. Moreover, whatever virtue chrysotherapy may have will surely be lost if it is not realized that this drug, like any other single measure of treatment in arthritis, is only a single link in a chain of therapeutic endeavors.

SUMMARY AND CONCLUSIONS

The cross section of actual medical practice as it relates to certain specific therapeutic measures in arthritis, based chiefly on a questionnaire survey and supported by our own experience, justifies the following conclusions:

1. Sulfur therapy is both without rationale and without effect.

2. Vaccines are apparently losing hold. Although their employment results in "benefit" in a proportion of cases, such results are attributable not to any specific effect of the vaccine but apparently to the psychologic effect of the injection.

13. Hartfall, S. J.; Garland, H. G., and Goldie, William: Gold Treatment of Arthritis: A Review of 900 Cases, *Lancet* 2: 784 (Oct. 2) 1937.
14. Copeman, W. S. C., and Tegner, W.: A Review of Gold Therapy, *Lancet* 1: 554 (March 6) 1937.

3. It is the practically unanimous opinion from all over the country that the therapeutic results from fever therapy are only transitory, and even these are obtained in such a small proportion of cases treated that this form of therapy cannot assume any place of importance. The risks involved, as well as the technical difficulties entailed, far outweigh any modicum of benefit that might be expected.

4. Sulfanilamide is unanimously condemned for use in rheumatoid arthritis.

5. Gold salts offer a promising, but at present dangerous, adjunct to the armamentarium of the practitioner.

6. There is no royal road to the successful treatment of arthritis. A well rounded medical management, tempered with sound clinical judgment, must still prevail as the best therapeutic regimen.

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MERCURY BICHLORIDE POISONING TREATED WITH SODIUM FOR- MALDEHYDE SULFOXYLATE

RESULTS IN FORTY CASES

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AND

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NEW ORLEANS

In 1934 Rosenthal¹ recommended sodium formaldehyde sulfoxylate as an antidote in acute mercury poisoning and at the same time reported ten cases in which it had been used without a fatality. Later in the same year we² reported seven cases in which this new antidote had been used, with, however, three deaths. Since that date we have observed the use of sodium formaldehyde sulfoxylate in an additional thirty-three cases of mercury bichloride ingestion, and the combined forty cases form the basis of this report. We make this contribution solely for the purpose of adding to the literature a representative number of cases in which this method of treatment has been used, for only by such reports can the proper place of this antidote in the treatment of acute mercury poisoning be determined.

Sulfoxylate was used according to the method suggested by Rosenthal:¹ Gastric lavage was performed with a 5 per cent solution, 200 cc. of which was left in the stomach. An intravenous infusion, consisting of 10 Gm. of sulfoxylate dissolved in 200 cc. of water, was also given, and this was repeated, as Rosenthal advises, in cases which seemed severe. In addition to the antidote, the patients received the usual treatment directed toward preventing or correcting the physiologic disturbance which occurs in mercury poisoning, the treatment including measures to combat early shock; parental administration of water, dextrose and salt to prevent dehydration, acidosis and chloride depletion; intravenous administration of sodium bicarbonate to prevent

acidosis; blood transfusions if significant bleeding occurred from the bowel, and appropriate symptomatic care.

In eighteen of the forty patients observed, 45 per cent, there developed symptoms of mercury poisoning, a proportion almost identical with the incidence of toxic manifestations of acute poisoning (44 per cent) in 278 cases of bichloride ingestion previously reported by us.³ The patients in this series received antidotes other than sulfoxylate or no antidotes at all.

Fourteen of the forty patients treated with sulfoxylate died. This is a mortality of 35 per cent for the whole group, and of 78 per cent for the eighteen patients in whom symptoms of mercury poisoning developed. In the 278 cases of bichloride ingestion just mentioned, the mortality for the whole series was 24 per cent and for the patients who had acute mercury poisoning 53 per cent.

Although the results of this study are not statistically significant because of the small number of cases observed, they do indicate that the use of sulfoxylate did not result in any protection against the toxic effects of bichloride ingestion. Indeed, the mortality for the series of cases in which it was used, 78 per cent, as compared with the mortality for the series in which it was not used, 53 per cent, raises the question as to whether its use was not actually harmful in the patients who had definite mercury poisoning after bichloride ingestion. This consideration becomes the more important in view of the experimental work of Brown and Kolmer,⁴ Rosenthal⁵ and Modell, Gold, Winthrop and Foot,⁶ who demonstrated that in experimental mercury poisoning sodium formaldehyde sulfoxylate is of value in the prevention of the manifestations of poisoning but aggravates preexisting intoxication.

The value of sulfoxylate as an antidote in bichloride ingestion depends on its ability to convert mercuric chloride to an insoluble mercurous compound. This conversion can take place only if the antidote is administered promptly after the ingestion of the poison. If its administration is delayed, the lapse of time permits the absorption of a lethal quantity of mercury and considerable corrosion of the gastrointestinal mucosa. In other words, such conversion of the mercury bichloride to an insoluble mercurous compound as does take place is incomplete and occurs too late to be of value. Undoubtedly this line of reasoning explains the failure of sulfoxylate in the forty cases we are reporting: As usually happens, most of the patients were not seen until an hour or more after they had ingested the poison, and then it was too late for the antidote to be effective.

SUMMARY AND CONCLUSIONS

Forty patients who had ingested mercury bichloride were treated with sodium formaldehyde sulfoxylate as an antidote, with a mortality for the whole group of 35 per cent. Eighteen of the forty patients, 45 per cent, became toxic, of whom fourteen, 78 per cent, died. The general results are no better than those obtained by other therapeutic measures and, if only the patients who

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1. Rosenthal, S. M.: Antidote for Acute Mercury Poisoning, *J. A. M. A.* 102:1273 (April 21) 1934.

2. Monte, L. A., and Hull, Edgar: Bichloride of Mercury Poisoning: Sodium Formaldehyde Sulfoxylate as an Antidote, *South. M. J.* 27:988 (Dec.) 1934.

3. Hull, Edgar, and Monte, L. A.: Bichloride of Mercury Poisoning: A Statistical Study of 302 Cases, *South. M. J.* 27:918 (Nov.) 1934.

4. Brown, Herman, and Kolmer, J. A.: Sodium Formaldehyde Sulfoxylate in Experimental Acute Mercurial Poisoning, *J. Pharmacol. & Exper. Therap.* 52:462 (Dec.) 1934.

5. Rosenthal, S. M.: The Use of Sodium Formaldehyde Sulfoxylate in Acute Mercury Poisoning, *J. Pharmacol. & Exper. Therap.* 54:34 (May) 1935.

6. Modell, Walter; Gold, Harry; Winthrop, G. J., and Foot, E. B.: Sodium Formaldehyde Sulfoxylate in Experimental Poisoning by Mercuric Chloride, *J. Pharmacol. & Exper. Therap.* 61:66 (Sept.) 1937.

had symptoms of poisoning are considered, the mortality of 78 per cent suffers by comparison with the mortality of 53 per cent reported by us in a series of 278 cases in which other methods of treatment were used.

Our experiences with sodium formaldehyde sulfoxylate seem to warrant the following conclusions:

- 1. No antidote suggested to date should in any way replace treatment directed toward combating physiologic changes which occur in acute mercury bichloride poisoning.
- 2. If sodium formaldehyde sulfoxylate is to be of any value as an antidote, it must be administered almost immediately after the ingestion of the bichloride.
- 3. Repeated use of sodium formaldehyde sulfoxylate in cases of mercury poisoning is probably inadvisable.

THE FREQUENCY OF COEXISTING
GALLBLADDER AND CORONARY
ARTERY DISEASE

A STATISTICAL ANALYSIS AND BIOMETRIC
EVALUATION OF 1,493 NECROPSIES

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As early as 1878¹ the association between gallbladder disease and heart disease was noted. Much recent comment, preponderantly favoring a significant relation between the two, has appeared in the literature. Many of these contributions have indicated a more than incidental relationship between cholecystic disease and coronary artery disease, although some authors deny that such a connection exists.

In 1935 eighty-eight cases of coronary artery disease with necropsy showing a striking frequency of gallbladder disease were reported from this laboratory.² This series was small and had not been subjected to biometric study. Moreover, neither the age incidence nor the frequency of gallbladder disease not combined with coronary artery disease had been determined for comparison. Therefore a larger series of necropsies was subjected to critical analysis with attention to all of the foregoing points.

To determine accurately what significance there might be, if any, in the coexistence of gallbladder disease and coronary artery disease in patients dying primarily as a result of the latter, two selected groups of records were chosen from 1,493 consecutive necropsy protocols filed in the department of pathology from 1928 to 1939.

The first series comprised 162 records. In these there were changes in the coronary vessels and myocardium considered to be the primary cause of death or the most significant contributing factor. The pathologic alterations consisted of occlusion of one or more coronary arteries by thrombosis or atherosclerosis with or without myocardial infarction or myosclerosis and mild to advanced coronary atherosclerosis with varying degrees of myosclerosis.

The second group comprised 363 records chosen on the basis of evidence of acute or chronic inflammatory gallbladder disease and the presence of gallstones.

Comparisons were then made of the incidence of cholecystic disease in relation to (1) the total number of necropsies, (2) the coronary artery disease group, (3) the various age groups of the total series of necropsies and (4) the various age groups of the coronary artery disease group. Comparison was also made with respect to the incidence in certain types of coronary artery disease.

In addition, biometric analysis of the data thus obtained was made, as suggested by the report of Tennant and Zimmerman,³ who used the biometric equation of Yule to calculate the coefficient of association for such a relationship as is being considered here.

RESULTS

Coronary Artery Disease.—Coronary artery disease considered to be the direct cause of death or the primary contributing factor, as judged by associated changes in the myocardium, occurred in 162 instances, or 10.8 per cent of the total number of necropsies. In 129 of these there was coronary occlusion, which in the greatest number of cases was due to atherosclerosis alone and in the remainder to coronary thrombosis alone or in combination with occluding atherosclerosis. Tabulated results and percentages are shown in table 1.

Myomalacia cordis was noted in seventy-nine instances in this group and advanced or extensive myosclerosis in seventy-five. Thirty-five records were encountered in which both changes were mentioned.

Gallbladder Disease.—Gallbladder disease was mentioned in 363 necropsy reports, or 24.3 per cent of the total number (1,493). In 115 of these it was listed as chronic adhesive pericholecystitis or as showing only adhesions, thickening, contraction or combinations of these. Two instances of acute fibrinous pericholecystitis were reported also. Excluding a total of 117 cases in which the question of an inflammatory lesion might be raised, the incidence is 16.4 per cent of the total, as shown in table 3. Record of cholecystectomy in which the gallbladder was reported as showing inflammatory changes, with or without stones, has been included also. Tabulation of the various types of gallbladder involvement is recorded in table 2.

In association with coronary artery disease, cholecystic disease was mentioned in seventy-nine reports. Tabulation of the details is included in table 2. Here, as before, question might be raised regarding twenty-four of these. Including them, the incidence of gallbladder disease in this group is 42.4 per cent; excluding them, 33.9 per cent, as shown in parenthesis in table 3.

Shown in table 1 is the percentage incidence of cholecystic disease in the various types of coronary artery disease. Correction has been made for doubtful instances of gallbladder involvement.

Comparing the incidence of the two most frequent types of gallbladder disease encountered in both groups, namely, chronic cholecystitis associated with stones, hydrops or other features, the contrast is striking, involving a 9.0 per cent incidence in the total group and a 21.6 per cent incidence in the group of coronary artery disease necropsies.

Age and Sex.—There was no consistent variation from the average in any group, male or female, so far as age was concerned. In a few instances the female averages were considerably above the general average.

From the Department of Pathology, St. Luke's Hospital.
1. Guéneau de Mussy, quoted by Revillon: *Gaz. d. hôp.*, 1878, p. 666, and by Schwartz, Morris, and Herman, *Albert: Association of Cholecystitis with Cardiac Affections: Study Based on 109 Cases*, *Ann. Int. Med.* 4:783-794 (Jan.) 1931.
2. Wilhelmy, E. W., and Helwig, F. C.: *Clinical and Pathologic Studies of Coronary Disease*, *J. Missouri M. A.* 12:476-480 (Dec.) 1935.

3. Tennant, Robert, Jr., and Zimmerman, H. M.: *Association Between Disease in the Gallbladder and in the Heart, as Evidenced At Autopsy*, *Yale J. Biol. & Med.* 3:493-503 (July) 1931.

and in one instance the average age of the male group was high. Averages for all groups, male and female, ranged from 58 to 65 years. The greatest number of reports were encountered in the age groups from 41 to 80, both in the general group and in the gallbladder group, as well as in the coronary group with and without gallbladder involvement.

The youngest man of the coronary group was 36 years old and the youngest woman 23. The latter showed a complete occluding coronary atherosclerosis,

TABLE 1.—Analysis of 162 Cases of Coronary Disease

Character of Lesion	Num-ber	Per- Cent of Total	Per Cent of Group	With Gallbladder Disease		Num-ber Ex- cluded	Cor- rected Per- cent- age
				Num- ber	Per Cent		
Occluding atherosclerosis...	59	3.5	36.4	30	50	11	38
Occluding atherosclerosis and coronary thrombosis	37	2.4	22.8	21	56	7	37
Coronary thrombosis.....	33	2.2	20.4	14	42	4	30
Advanced atherosclerosis ..	21	1.4	13.0	9	42	0	42
Mild to moderate athero- sclerosis.....	12	0.7	7.4	5	41	2	25

Total number of necropsies, 1,493; total number with coronary disease, 162; total number with gallbladder disease, 363; total number with gallbladder disease and coronary disease, 79.

and the former coronary thrombosis with occluding atherosclerosis. One man aged 37 showed advanced coronary atherosclerosis and myosclerosis; a woman aged 35 showed coronary thrombosis and occluding coronary atherosclerosis. None of the four showed any evidence of gallbladder disease. The distribution of the numbers of each group according to age and sex is shown in table 3.

Comparison of the incidence of gallbladder disease according to sex is shown in table 3. Figures in parentheses are those obtained when doubtful instances of gallbladder disease were omitted from the calculation. In the general group this totaled seventy-five for the males and forty-two for the females; in the coronary group with gallbladder disease there were twenty-one men and two women in whom the recorded gallbladder changes were regarded as questionable.

Comparison of the incidence of gallbladder disease according to age and sex, particularly in the age group from 41 to 80, is shown in table 4. It is evident here that the occurrence of cholecystic disease in general is higher in the age group from 61 to 80 regardless of other conditions or sex. However, in the group of reports in which coronary disease and gallbladder disease were both noted there is an irregular incidence of this feature when the incidence according to sex is determined. In only one group, the women of ages from 71 to 80, is the incidence of gallbladder disease in association with coronary disease lower than that of the general group. The incidence, however, for the entire group of coronary disease necropsies is higher than for the corresponding general group of the same age (71 to 80). The percentages given for males and females of various age groups in table 4 do not include any questionable instances of gallbladder disease and should be compared with the corrected percentages in that table.

In all groups there was noted a preponderance of males. In the selected group of 363 instances of gallbladder disease, however, after exclusion of doubtful records, the male and female incidence was practically the same. Table 3 shows the comparative figures obtained in this connection.

Coefficient of Association.—The formula of Yule, as illustrated by Tennant and Zimmerman,³ is as follows:

$$Q = \frac{N - \frac{(A)(B)}{(AB)}}{2[(AB) - (A) - (B)] + N + \frac{(A)(B)}{(AB)}}$$

where N represents the total number of necropsies, (A) the number of necropsies in which coronary artery disease was observed, (B) the number of necropsies in which gallbladder disease was observed, (AB) the number of necropsies in which both coronary artery disease as specified and gallbladder disease were observed, and Q the coefficient of association.

As stated by Tennant and Zimmerman,³ if $Q = 1$ there is a complete positive association, and if $Q = -1$ there is complete dissociation.

Using this equation the present study yielded a coefficient of association of 0.55 for the 1,493 necropsy records examined. Excluding doubtful instances of gallbladder disease (117 of the general group and twenty-four of the coronary group) the equation yielded a figure of 0.50.

Coefficients were calculated also for the various age groups from 41 to 80 and for males and females. This is shown in table 5. The equation was also utilized in calculating a coefficient in which only the instances of chronic cholecystitis with additional involvement such as stone and hydrops were considered. The figure obtained was 0.54.

It will be noted that the coefficients obtained for the various age groups after exclusion of doubtful instances of gallbladder disease are lower than those calculated for the entire series, and for males and females. Of all age groups the coefficient for the group from 61 to 70 is the lowest. In this connection it is interesting to

TABLE 2.—Various Types of Gallbladder Involvement

Type of Gallbladder Disease	Entire Group: 1,493 Necropsies			Coronary Artery Disease with Gallbladder Disease		
	Total	Male	Female	Total	Male	Female
Acute cholecystitis.....	3	2	1	..	..	..
Acute fibrinous pericholecystitis	2	1	1	..	..	..
Chronic cholecystitis.....	32	17	15	5	5	0
Chronic cholecystitis with additional features (stones, hydrops, empyema, cholesterosis, rupture, infarction, acute cholecystitis).....	135	66	69	35	27	8
Cholecystectomy, gallbladder showing chronic inflammation with or without stones..	32	13	19	6	3	3
Cholesterosis.....	18	12	6	5	4	1
Cholesterosis with stones.....	1	1	0	1	1	0
Cholelithiasis.....	24	10	14	3	2	1
Hydrops.....	1	0	1	..	..	..
Thickening, adhesions, thickening and adhesions, contraction and adhesions, chronic adhesive pericholecystitis.....	115	78	37	24	22	2
Totals.....	363	200	163	79	64	15

note, although it is not being considered primarily in this study, that of eleven instances of diabetes in the coronary disease group eight occurred after the age of 60 and four in the age group from 61 to 70. All but one of these showed gallbladder involvement of unquestionable character.

Shown in table 5 are the coefficients obtained for the various groups, with and without exclusion of doubtful instances of gallbladder disease.

COMMENT

In 1931 Tennant and Zimmerman³ found a significant association between heart disease in general and gallbladder disease in a biometric study of 1,600 necropsies, using the equation of Yule. They found, more particularly, a significant association with arteriosclerotic heart disease but noted that the association was considerably lower in the age groups after 51, in which most instances of both this type of heart disease and gallbladder disease lay. Included in their study, however, were carcinoma of the bile ducts, chronic pericholangitis and obstruction of the common bile duct, which are not included in this report.

Others have reported what they consider to be a significant association between coronary disease and gall-

of cardiac disease to be higher in the presence of cholecystitis. Leech,⁹ however, in examining 116 instances of gallbladder disease, was unable to find any definite relationship with heart disease.

A number of observers¹⁰ have reported improvement in heart disease, and more specifically in angina pectoris and coronary occlusion, following cholecystectomy. Attention has been called by several authors¹¹ to the presence of certain varying cardiac changes appearing during acute attacks of gallbladder disease. Schwartz and Herman¹ found mention of this by Oddo in 1893 and by others from 1878 to 1893 of a relation between gallbladder disease and heart disease.

Opinions with regard to the pathologic and clinical evidence presented in favor of such a relation vary.

TABLE 3.—Age and Sex Incidence of Gallbladder Disease and Coronary Disease

Age	General Group: 1,493 Necropsies			Gallbladder Group: 363 Necropsies			Coronary Group: 162 Necropsies			Coronary Group— Gallbladder: 79		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-10.....	61	40	21	..	..	..	..	..	..	..	..	..
11-20.....	80	41	39	1	1	..	..	..	..	..	..	..
21-30.....	129	56	73	5	1	4	1	..	1	..	..	..
31-40.....	170	85	85	17	8	14	5	4	1	..	..	..
41-50.....	239	152	87	70	40	30	28	25	3	14	12	2
51-60.....	281	176	105	80	50	30	37	34	3	19	16	3
61-70.....	289	182	107	99	53	46	49	36	13	20	14	6
71-80.....	169	113	56	65	38	27	32	26	6	17	15	2
81-90.....	42	25	17	21	10	11	7	4	3	6	4	2
91-100.....	5	2	3	3	2	1	..	..	..	..	..	..
No age given.....	28	13	15	2	2	..	3	3	..	3	3	..
Totals.....	1,493	885	608	363	200	163	162	132	30	79	61	18
Per cent.....		59.2	40.8		55 (50.8)	45 (49.2)		81.4	18.6		84 (76)	15 (21)
Percentage with gallbladder disease	24.3 (16.4)	22 (14)	26 (19)				42.4 (33.9)	48 (32)	50 (43)			

TABLE 4.—Age and Sex Incidence of Gallbladder Disease

Age	Percentage Incidence of Gallbladder Disease in Various Age Groups of 1,493 Necropsies						Percentage Incidence of Gallbladder Disease in Various Age Groups Showing Coronary Artery Disease					
	With Gallbladder Disease		Number Excluded	Corrected, per Cent	Male, per Cent	Female, per Cent	With Gallbladder Disease		Number Excluded	Corrected, per Cent	Male, per Cent	Female, per Cent
	Number	Per Cent					Number	Per Cent				
41-50.....	239	70	29.0	25	18.8	14	23	28	14	50.0	6	23.5
51-60.....	281	80	28.4	31	17.4	13	23	37	19	51.3	9	27.0
61-70.....	289	99	34.2	25	23.9	21	34	49	20	40.8	4	22.6
71-80.....	169	65	38.4	14	30.1	25	39	32	17	53.1	3	43.1

bladder disease, Willius and Brown⁴ noting a 24 per cent incidence of the latter in eighty-six instances of coronary sclerosis coming to autopsy, Bean⁵ 17.5 per cent in 269 cases of cardiac infarction, 90 per cent of which were described as cholelithiasis alone, Miller⁶ reporting 350 necropsies in which coronary thrombosis occurred more frequently in the presence of gallbladder disease, and Campbell⁷ that the majority of ten patients with coronary thrombosis had demonstrable gallbladder disease.

With regard to heart disease in general, Brockbank⁸ found in 1,347 necropsies that the presence of a cardiac lesion doubled the incidence of cholelithiasis. Mills and Bull⁸ noted in 533 necropsies that cardiac disease favored the occurrence of cholelithiasis at an earlier age. Schwartz and Herman¹ observed the incidence

Leary¹² and MacCallum¹³ regard infection in general as minor in significance in the pathogenesis of atherosclerosis; William Boyd¹⁴ feels that chronic infection

4. Willius, F. A., and Brown, G. E.: Coronary Sclerosis: An Analysis of Eighty-Six Necropsies, *Am. J. M. Sc.* 168:165-180 (Aug.) 1924.
5. Bean, W. B.: Infarction of the Heart, *Am. Heart J.* 14:634-702 (Dec.) 1937.
6. Miller, C. H.: Gallbladder and Cardiac Pain, *Lancet* 1:767-772 (Jan.) 1932.
7. Campbell, S. B.: Influence of Infections on the Incidence of Coronary Thrombosis, *Brit. M. J.* 1:781-786 (April 18) 1936.
8. Quoted by Rolleston and McNeer.¹²

9. Leech, C. B.: Association of Gallbladder Disease and Heart Disease, *New England J. Med.* 200:1318-1321 (June) 1929.
10. Barnes, A. R.: The Cardiac Aspect of Surgical Risk, *Proc. Staff Meet., Mayo Clin.* 11:628-629 (Sept. 30) 1936. Graham, E. A.; Cole, W. A.; Copher, G. A., and Moore, Sherwood: Diseases of the Gallbladder, and Bile Ducts, Philadelphia, Lea & Febiger, 1928. Fitz-Hugh, Thomas, and Wolferth, C. C.: Cardiac Improvement Following Gallbladder Surgery, *Ann. Surg.* 101:478-483 (Jan.) 1935. Willius, F. A.: Fitzpatrick, J. M.: Relationship of Chronic Infection of the Gallbladder to Disease of the Cardiovascular System, *J. Iowa M. Soc.* 15:597 (Nov.) 1925. Lichty, M. J.: Cardiac Affections from Gallbladder Disease and Appendicitis, *Ohio State M. J.* 11:779, 1915.
11. Osler, William: Principles and Practice of Medicine, revised by Thomas McCrae, ed. 11, New York, D. Appleton & Co., 1930. Reisman, David: The Development of Cardiac Murmurs During Attacks of Biliary Colic, *J. A. M. A.* 48:1589 (May 11) 1907. Flint, H. L.: Cholelithiasis of Heart, *Brit. M. J.* 2:819 (Nov. 27) 1920. Weiss, Samuel: Diseases of the Liver, Gallbladder, Ducts and Pancreas, New York, Paul B. Hoeber, Inc., 1935. Rehfuess, M. E., and Nelson, G. H.: Medical Treatment of Gallbladder Disease, Saunders Company, 1935. Skiston's Son & Co., 1935. Neuhof, Selian: The Gallbladder and Heart.
Roberts, S. R.: Dia.
Illinois M. J. 56:317-321 (Nov.) 1929.
12. Leary, Timothy: Atherosclerosis, *Arch. Path.* 21:419 (April) 1936.
13. MacCallum, W. G., in Cowdry, Edmund V.: Arteriosclerosis: A Review of the Problem, New York, Macmillan Company, 1933.
14. Boyd, William: Pathology of Internal Diseases, ed. 2, Philadelphia, Lea & Febiger, 1935.

is the most likely agent. Adam Boyd¹⁵ comments that infections may be at work in continuing and advancing arteriosclerotic lesions already present and possibly due at the outset to an infectious process.

More specifically, with regard to gallbladder disease Bean⁵ believes that cholelithiasis is not an etiologic agent but evidence of some primary disturbance in the lipid-cholesterol metabolism which is probably also at fault in atherosclerosis. Warren¹⁶ agrees with this in connection with the high incidence of cholelithiasis and arteriosclerosis in diabetes. Rolleston and McNee,¹⁷ however, suggest that heart disease favors the formation of gallstones by tending to make life more sedentary and leading ultimately to stagnation of bile. Miller,⁶ Fitz-Hugh and Wolferth,¹⁰ Mayo¹⁸ and Babcock¹⁹ state that gallbladder disease may damage the myocardium, dispose to arterial degeneration or initiate changes in the coronary vessels.

It is apparent from this study that the general incidence of gallbladder disease is higher in the presence of coronary artery disease of the types specified here. In the general series this difference is 17.5 per cent and in the specific types of coronary involvement it ranges from 8.6 to 25.6 per cent, the difference in incidence being greatest in association with advanced atherosclerosis, coronary thrombosis, occluding sclerosis and combinations of the two conditions last mentioned.

A similar contrast is noted in the various age groups from 41 to 80, the difference ranging from 6.7 to 18.1 per cent, being highest in the groups from 41 to 60 and from 71 to 80. In males and females of the general and selected series the difference in incidence ranges from 18 to 24 per cent. In males and females of certain age groups the higher incidence of gallbladder disease in association with coronary artery disease is repeated, ranging from 15 to 34 per cent in males from 41 to 80 and from 4 to 77 per cent in the females of ages from 41 to 70. In the female age group from 71 to 80 the

from 61 to 70, but the occurrence of other factors not taken into consideration here indicates the need for further evaluation of these factors in the general group. It should also be taken into consideration that while a large number of instances of gallbladder disease were excluded from the calculations, as noted in the various tables, many of these might be included after further microscopic examination.

CONCLUSIONS

A statistical study of 1,493 necropsy records indicates a striking and positive association regardless of age or sex between gallbladder disease and coronary artery disease where the latter is regarded as the direct cause of death or the primary contributing factor toward death.

CEREBRAL SYMPTOMS IN FEVER THERAPY

WITH ESPECIAL REFERENCE TO CEREBRAL HYDRODYNAMICS AND PRESSURE-VOLUME RELATIONSHIPS: A STUDY OF FOUR CASES

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Certain definite physical and hydrodynamic alterations take place intracranially during fever therapy and demand immediate recognition by the clinician or technician in charge. Certain dangers incident to treatment can thus be avoided, the patient made more comfortable and the management of certain diseases made more efficacious by proper treatment.

It is important to recognize early symptoms and signs of cerebral anoxia and edema which are produced during the course of artificial fever therapy. The recognition of certain characteristic manifestations of cerebral hyperemia is equally important. By properly timed spinal drainage, the intracerebral pressure and volume relationships can be maintained at a normal level and the dangerous phases of cerebral anemia and hyperemia can be prevented. It is a well recognized fact that serious and permanent brain damage may occur when either state prevails.

During the course of hyperpyrexia several salient physiologic changes are recognized.¹ In the induction phase there is a mild circulatory embarrassment due to a rapid drop in the cardiac ventricular filling time, while the emptying time drops only slightly. The filling time is actually shorter than the emptying time, manifesting itself clinically in mild apprehension and weakness. These alterations are produced by peripheral vascular collapse. The so-called compensatory phase takes place at from 103 to 104 F. and there is less circulatory embarrassment. This mechanism, while a part of the picture, is not dangerous.

Peripheral vascular collapse takes place, as evidenced by a rapid fall in diastolic pressure.¹ The diastolic pressure is often completely abolished, pointing to a mild induced strain on the cardiac musculature.

TABLE 5.—Coefficients of Association

Group	Coefficient (No Doubtful Instances Included)	
	Coefficient	Included
Entire series.....	0.55	0.50
41-50.....	0.38	0.30
41-60.....	0.52	0.31
61-80.....	0.24	0.27
51-70.....	0.34	0.26
41-50.....	0.46	0.50
51-60.....	0.52	0.32
61-70.....	0.17	0.20
71-80.....	0.35	0.32
Males.....	0.60	0.37
Females.....	0.52	0.53

incidence is 6 per cent lower in the coronary group than in the group without significant coronary artery disease.

Biometric analysis of the data obtained shows a positive association between cholecystic disease and coronary artery disease regardless of age or sex. The figures for the entire series and for male and female groups approach a complete positive association; those obtained for the various age groups from 41 to 80 are somewhat lower than these but remain positive. The lowest coefficient of association obtained was that for the ages

15. Boyd, Adam: Inflammatory Basis for Coronary Thrombosis, *Am. J. Path.* 4: 159-166 (March) 1928.
16. Warren, Shields: Pathology of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1930.
17. Rolleston, Humphry, and McNee, J. W.: Diseases of the Liver, ed. 3, London, Macmillan Company, 1929.
18. Mayo, W. J.: Certain Medical and Surgical Aspects of Biliary Apparatus, *Illinois M. J.* 45: 33-37 (Jan.) 1924.
19. Babcock, R. H.: Chronic Cholecystitis as a Cause of Myocardial Incompetence: Report of Thirteen Cases, *J. A. M. A.* 52: 1904-1911 (June 12) 1909.

Miss Irene Neider, R.N., assisted during this study.
From the services of Dr. Charles L. Brown and Dr. Temple Fay.
Dr. Wood is clinical assistant in medicine and Director of the Department of Physical Medicine; Dr. McCravey is Fellow in neurosurgery.
From the Departments of Medicine (Dr. Wood) and Neurosurgery (Dr. McCravey) of the Temple University Medical School and Temple University Hospital.
1. Krusen, F. H., and Elkins, E. C.: Fever Therapy by Physical Means, *J. A. M. A.* 112: 1689-1696 (April 29) 1932.

Increased meningeal permeability has long been known to take place during the course of high fever, in toxic states and in the presence of pathologic lesions such as meningitis.² This can be proved by determining the bromide quotient.

Increase in spinal fluid volume and pressure relationships as shown in this series of cases is a result of increased meningeal permeability which produces a compensatory elevation of the systolic blood pressure and, in turn, pulse pressure. Cushing and Becht³ believe that, when the intracranial pressure approaches that of arterial blood, the arterial pressure will rise higher to compensate in order to maintain adequate cerebral circulation. Manometric determinations show a definite increase in cerebrospinal fluid pressure and volume during artificially induced fever. However, as

pulse pressure has been considered 40.⁴ In case 1, treatment 1, the pulse pressure went as high as 122.

The clinical status of such patients is usually that of stupor and drowsiness. We interpreted these signs as being due to cerebral anoxia, the result of an increase in cerebrospinal fluid volume and decrease in cerebral blood volume. The spinal pressure may not be increased and is not a direct index of the amount of anoxia present. The spinal fluid pressure is simply the index of the apposition of two volumes and tells us nothing as to which volume is greater, blood or cerebrospinal fluid. In all our cases when these signs and symptoms were present, reduction in spinal fluid volume by lumbar puncture and drainage of from 24 to 48 cc. increased the blood volume circulating through the brain and was followed by a prompt fall of the pulse pressure to

Summary of Four Cases

Case, Age, Sex, Diagnosis	Date Treated	Before Temperature Elevation							Height of Temperature (Average 104 F.)						After Spinal Drainage					
		Blood Pressure	Pulse Pressure	Medication	Cerebrospinal Fluid, Mm. Hg			Blood Pressure	Pulse Pressure	Mental Status	Cerebrospinal Fluid, Mm. Hg			Blood Pressure	Pulse Pressure	Cerebrospinal Fluid, Mm. Hg			Mental Status	
					Initial Pressure	Final Pressure	Total Drainage				Initial Pressure	Final Pressure	Total Drainage			Initial Pressure	Final Pressure	Total Drainage		
1 ♂	3/ 7	100/60	40	None	No drainage			142/20	122	Stupor	28	10	28	120/70	50	..	..	..	Reactive, alert
8 ♂	3/14	118/70	48	None	2	2	2	120/60	60	Mania	6	2	2	106/50	56	..	..	..	Maniacal
Chorea	4/ 4	100/70	30	Soluble phenobarbital, 2 gr.	16	0	50	149/70	78	Mania	5	0	17	100/70	30	-24 hr. inter- 14	0	17	While T. was over 100 F. patient was maniacal	
2 ♂	2/ 7	No observations							No observations		Stupor	No observations							Stuporous	
50 ♂	3/ 9	100/70	30	None	8	0	28	142/58	84	Stupor	12	2	30	120/70	50	..	..	..	Reactive, alert
Multiple sclerosis	3/16	100/70	30	None	6	0	18	140/65	75	Stupor	16	0	30	118/58	60	..	..	..	Reactive, alert
3 ♂	5/ 4	130/60	70	None	8	0	26	150/30	120	Stupor	12	0	42	130/60	70	..	..	..	Reactive, euphoric
56 ♂	5/ 9	116/70	46	Pantopon ½ gr.	10	0	30	134/50	83	Restless	12	0	48	134/60	74	-24 hr. later- 6	0	20	Reactive, euphoric	
Central nervous system syphilis	5/11	118/70	48	None	..	..	..	140/65	85	Restless	4	0	3	106/55	51	..	..	..	Depression psychosis
	5/16	122/60	62	None	..	..	..	138/50	88	Stupor	No drainage			160/55	105	No drainage			Irrational, stuporous
4, ♂, 47	6/ 6	130/80	50	None	..	..	..	120/75	55	Stupor	10	0	24	110/75	45	..	..	..	Reactive, alert
Multiple sclerosis	6/ 8	130/80	40	None	140/90	50	Irrational	No drainage			No observations						Irrational

* Patient had been euphoric before treatment.

shown in most of our cases, the volume of cerebrospinal fluid was a more accurate index of cerebral anemia than the pressure alone. This has long been recognized by Temple Fay.⁴

The surprisingly high pulse pressure found in these cases strongly parallels the observations made in acute cerebral trauma and wet brain, in which it has been shown to be related to cerebral anoxia. The double mechanism of peripheral vascular collapse causing low diastolic pressure, and a compensatory elevation of systolic blood pressure, is found in patients subjected to hyperthermic treatments. The increased cerebral pressure and volume relationships noted during hyperthermia, we believe, influence the vasomotor centers. We have found the pulse pressure to be the best clinical index as to the state of cerebral circulation. The normal

normal, the mental state also returning to normal as evidenced in case 3, treatment 1.

When total spinal drainage preceded fever induction, thereby depleting the intracranial water bed, increased cerebral activity during hyperthermic treatment was evidenced by the maniacal reactions of the patient (treatment 2, case 1). These reactions were noted during the initial phase of induction. In treatment 3, case 1, 2 grains (0.1 Gm.) of soluble phenobarbital did not manifest the slightest sedation effect on an 8 year old boy. In both these instances a low intracranial cerebrospinal fluid volume was induced and reciprocally permitted cerebral hyperemia (Munro-Kellie doctrine).

This abnormal cerebral hyperemia we believe favors increased metabolic activity and function of cerebral centers as well as favoring a temporarily disturbed water balance. Thus stupor may be considered as a result of cerebral anoxia and delirium as a result of hyperemia. It is dangerous to continue fever therapy in altered physiologic states which are not susceptible to hydrodynamic control.

2. Neymann, C. A.: *Artificial Fever Produced by Physical Means*, Springfield, Ill., and Baltimore, Charles C. Thomas, Publisher, 1938, p. 55.

3. Cushing, Harvey, and Becht, F. C., cited by Ferris, E. B., Jr.: *J. Clin. Investigation* 18:19 (Jan.) 1939.

4. Fay, Temple: *Ann. Surg.* 101:76 (Jan.) 1935.

METHOD

1. Patients with varied disease conditions and of various ages were selected for observation.
2. Electromagnetic induction was used to produce hyperpyrexia.
3. The blood pressures, pulse pressures, pulse rate, respiratory rate and mental state were noted every fifteen minutes during the course of fever.
4. Spinal puncture with pressure and volume determinations was done at 104 F.
5. Immediately after spinal puncture the temperature, pulse rate, respiratory rate, blood pressure, pulse pressure and mental state were recorded.

COMMENT

In this series we have shown that the extreme states of cerebral anoxia and hyperemia do occur and can be readily recognized clinically.

The salient feature noted is the dramatic clinical change produced by disturbance of intracranial volume-pressure relationships. The depth of the stupor was proportional to the height of the pulse pressure. Stupor was abolished, pulse pressure assumed a normal level and the patient was more alert after spinal drainage. When a complete spinal drainage was performed immediately prior to fever induction, the opposite clinical picture showed itself, i. e. mania, irritability, rapid pulse and respiration and relatively low pulse pressure. We have found pulse pressure to be the best clinical index as to the state of cerebral circulation. Spinal drainage at the height of the fever curve in these cases showed a low volume and low pressure reading. From 15 to 20 cc. was considered a normal complete spinal fluid drainage.

It is obviously important that one should be able to stabilize such a relationship in order to prevent drastic consequences. Certain untoward and critical symptoms which have occurred during fever therapy may be explained on this basis and could have been prevented if the importance of the intracranial relationships of volume and pressure had been more clearly visualized.

The unwarranted use of opiates when vital centers are already depressed by profound cerebral anemia would indeed seem hazardous.

SUMMARY

1. Cerebral hydrodynamics was studied in four cases of fever therapy. A total of twelve treatments was given.
2. The pulse pressure was found to be the best clinical index for determining the state of cerebral circulation.
3. Cerebral anoxia can be relieved by properly timed and sufficient removal of cerebrospinal fluid.
4. Cerebral hyperemia can be prevented by sufficiently stabilizing intracranial volume-pressure relationships.

Glucose and Glycogen.—Grape sugar or glucose is the form into which starchy food is changed in order to be suitable for use in the body. Of all the materials supplied by the food, glucose is the most important. When it is provided in abundance it is preferably utilized; the burning of fat is then almost completely stopped. Furthermore, according to present views, glucose or its storage precursor, glycogen, is essential for muscular contraction. The substance is continuously being used, therefore; even during sleep the heart muscle and the muscles of respiration are consuming glycogen, and it can be renewed only periodically.—Cannon, Walter B.: *The Wisdom of the Body*, New York, W. W. Norton & Co., Inc., 1939.

Clinical Notes, Suggestions and New Instruments

ASCORBIC ACID IN THE TREATMENT OF CHRONIC LEAD POISONING REPORT OF A CASE OF CLINICAL FAILURE

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Holmes, Campbell and Amberg¹ recently reported evidence of the value of ascorbic acid in chronic lead poisoning. They administered 100 mg. of ascorbic acid daily to thirty-four workers who suffered clinically from excessive absorption of lead. With this treatment the blood picture as well as the clinical symptoms showed decided improvement. A further study by them of three house painters who suffered from chronic lead poisoning reinforced the conclusions drawn from the study of the factory workers.

The opportunity to study the effect of this vitamin in a case of lead poisoning presented itself to us:

R. M., a white boy aged 27 months, was admitted Sept. 30, 1939, with the following history: His birth was spontaneous and without difficulty. Development appeared to be normal until he was approximately 15 months old, when he began to eat wood, paper and painted articles. Parental control of the abnormal appetite met with little success. In May 1939, at the age of 23 months, he was studied in the outpatient department of another institution, but nothing significant was found, although blood studies and x-ray examination of the long bones were made.

In July, two months before admission, he began to vomit, immediately after and between meals. The vomiting at first was intermittent but later became persistent. Inability to walk or to sit upright gradually developed and, three days before admission, internal strabismus of both eyes was noted for the first time by the mother.

On physical examination the child was pale, somnolent and irritable. The rectal temperature was 100 F., the pulse rate 108 and the respiratory rate 30 per minute. The head had prominent frontal bosses and was flattened in the anteroposterior diameter. Macewen's sign was elicited. The sternum had a typical "pigeon breast" deformity. The eyes showed bilateral external rectus palsy. The fundi were normal. A slight post-nasal discharge was present, but otherwise nothing abnormal was found in the ears, nose, mouth or pharynx. The heart, lungs and abdomen were likewise normal. Neurologic examination showed hypotonia of all the muscles and the presence of all tendon reflexes. The Kernig and Brudzinski signs were not present. There was no nuchal rigidity. The Babinski sign was present on both sides. He had coarse muscle tremors on motion of the extremities.

A diagnosis of chronic lead intoxication with lead "encephalosis" was made and confirmed by the presence of basophilic stippling in the red blood cells and the characteristically increased density and width of the zone of provisional calcification of the long bones on x-ray examination.

For seventeen days the treatment consisted of the daily administration of ascorbic acid 100 mg. by mouth in divided doses and 250 mg. intravenously. In spite of this treatment, the child grew steadily worse. The vomiting, which could not be controlled by sedatives, persisted to such a degree that parenteral fluids had to be given. The weight dropped from 36 to 26 pounds (16.3 to 11.8 Kg.) and he became markedly emaciated. Somnolence and weakness increased while his tremulousness was intensified by the muscular wasting. Except on admission, lumbar punctures revealed no great increase in cerebrospinal fluid

From the Pediatric Department of the Jewish Hospital, Philadelphia.
1. Holmes, H. N.; Campbell, Kathryn, and Amberg, E. J.: Effect of Vitamin C on Lead Poisoning, *J. Lab. & Clin. Med.* 24:1119 (Aug.) 1939.

pressure, and analyses did not deviate from the normal. Other laboratory studies included serial blood counts, shown in the accompanying table. The lead in the blood² October 12, twelve days after onset of treatment, was 0.257 mg. per hundred cubic centimeters (normal 0.02 mg.).

For the first time on October 17 examination of the fundi revealed bilateral choked disks. Because of the child's poor condition it was deemed best to discontinue the ascorbic acid therapy. Instead, 10 cc. of a 10 per cent solution of disodium phosphate was given four times a day. In addition, a daily dose of forty-five drops of viosterol and 50 mg. of ascorbic acid were given. This was supplemented by a high calcium and phosphorus diet, which included 1 quart of milk and the yolks of two eggs. October 20, a daily dose of thiamin chloride 10 mg. and 1 cc. of liver extract, 2 U. S. P. units, were also begun.

After a few days on this regimen it was noted that the vomiting was becoming less frequent. Within ten days there was a marked improvement in the patient's general condition. This occurred in spite of an acute attack of nasopharyngitis, from which he promptly recovered. The vomiting ceased and his appetite improved. Gradually the child began to recognize objects, play feebly with his toys, obey commands and seem more cheerful. Seventeen days after the new regimen was

Results of Laboratory Studies on the Blood

Dates	Red Blood Cells	Hemoglobin, Gm.	Reticulocytes, per Cent	Stippled Cells, per Cent	White Blood Cells	Lymphocytes, per Cent	Polymorphonuclears, per Cent	Blood Lead, Mg. per 100 Cc.	Comment
10/ 1	.....	...	...	8.0	.....	..	..	.....	Ascorbic acid therapy: somnolence, muscular tremors, persistent vomiting, marked loss in weight, choked disks
10/ 2	2,800,000	6.7	...	...	22,600	46	51	.....
10/ 6	4,000,000	8.2	4.0	7.2	.....	..	..	.....
10/12	.....	...	...	6.0	24,900	18	82	0.257	
10/17	3,400,000	8.0	...	5.8	24,000	22	78	.....	Disodium phosphate therapy: prompt cessation of vomiting
10/22	.....	...	...	5.4	.....	..	..	.....
10/29	3,000,000	7.1	4.4	5.0	20,500	26	74	.....	Marked improvement in mental and physical symptoms
11/ 3	.....	...	4.5	4.9	.....	..	..	.....
11/14	3,660,000	9.1	...	0.6	8,400	45	55	0.190	
11/17	.....	...	...	0.0	.....	..	..	.....
12/ 4	4,050,000	10.5	...	0.2	8,200	60	40	.....
12/14	4,100,000	10.5	...	0.0	10,400	39	61	.....

started he sat up without support, and six days later he could walk, although his gait was ataxic. His nutritional state had markedly improved and, with the increased vigor, muscular tremor became less marked. Papilledema gradually lessened and a definite improvement of the internal squint of the right eye was noted. The number of stippled cells rapidly diminished as clinical improvement occurred, as shown in the table.

On November 14 the lead in the blood was 0.190 mg. per hundred cubic centimeters. The roentgenogram showed no change in the lead line from the previous examination and only six stippled cells per thousand red blood cells were present.

On December 22, eighty-three days after admission, he was discharged, at which time he was a well nourished, active child. His gait was still somewhat ataxic, and slight tremor of the upper extremities was also present. In spite of the latter he ate unaided, showed interest in his toys and was able to say a few words. Slight weakness of the left external rectus muscle remained and signs of a secondary optic atrophy was noted.

CONCLUSIONS

Extremely large doses of ascorbic acid were without effect in the treatment of lead intoxication in a child aged 27 months. 235 South Fifteenth Street.

2. Dr. John G. Reinhold and his staff at the Philadelphia General Hospital made the blood lead determinations.

INCREASED INTRACRANIAL PRESSURE ATTRIBUTED TO VENOUS OBSTRUCTION

BENEFICIAL EFFECT OF UPRIGHT POSTURE

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Serous meningitis,¹ otitic hydrocephalus,² pseudotumor or pseudo-abscess of the brain, intracranial serous effusions and intracranial hypertension of unknown cause³ are synonymous terms when applied to a specific syndrome of increased pressure in the cerebrospinal fluid marked by headache, failing vision, papilledema and occasionally vomiting.

The apparent general well-being of the patient and normal conditions (except for papilledema) on neurologic examination are as impressive as the fact that pneumoroentgenograms reveal the ventricles of the brain to be normal in size, shape and position. General agreement on the cause of this condition has never been attained.

The following case report is submitted because the study of this patient has led to certain suggestions concerning the cause and treatment of this syndrome:

REPORT OF CASE

A white married woman aged 21, admitted to the University Hospital May 27, 1939, complained of chronically discharging ears for six years and of an exacerbation of pain and discharge for ten days. There were general malaise and poor appetite for one week. The rest of the history was irrelevant.

On admittance the patient, who was well developed and poorly nourished, appeared ill and apprehensive. The rectal temperature was 102.8 F., the pulse rate 110 per minute and the respiratory rate 25 per minute. Examination of the ears revealed pus in each external canal, obliteration of the drum marking and some serous discharge on the drums. There was tenderness anterior to the left auricle and over the left mastoid process. General physical examination yielded no other abnormal results.

The leukocytes numbered 11,240 per cubic millimeter of blood of which 81 per cent were polymorphonuclears. Results of urinalysis were essentially normal. Roentgenograms revealed pneumatic mastoid processes and evidence of mastoiditis on the right with destruction. The Wassermann reaction of the blood was negative.

On the day of admission a lumbar puncture revealed clear colorless fluid under a pressure of 20 cm. of water. Jugular compression on each side caused an abrupt rise in pressure of from 8 to 10 cm., which promptly receded on release. There were 5 cells per cubic millimeter of spinal fluid. Repetition of the lumbar puncture May 29 again revealed essentially normal spinal fluid under a pressure of 5.5 cm. of water.

Smears and cultures of the spinal fluid revealed no organisms. Culture of the discharge from the left ear revealed Staphylococcus aureus, diphtheroid bacilli and Streptococcus haemolyticus (beta). Eighty grains (5 Gm.) of sulfanilamide was administered daily for three days. A temperature of the remittent type varying between 103 and 100 F. (rectal) was observed. On the day after admission the patient had a chill and the temperature promptly rose from 99.6 to 102.8 F.

May 29 a simple left mastoidectomy disclosed hemorrhagic mastoiditis with no definite coalescence of the mastoid cells. The lateral sinus was exposed from the superior knee almost to the jugular bulb. The wall of the sinus appeared thickened and white. Then the sinus was opened and free bleeding was obtained. The wound was packed with iodoform gauze and closed.

On the day following operation the temperature did not exceed 102 F. A small amount of serosanguineous discharge was found when the dressing was changed. The patient received a transfusion of 500 cc. of citrated blood; her temperature continued to subside and remained normal after the second post-

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1. Davidoff, L. M., and Dyke, C. G.: Series of Cases of Serous Meningitis, Arch. Neurol. & Psychiat. 36:1376-1380 (Dec.) 1936.

2. Williams, H. L.: Otitic Hydrocephalus, Arch. Otolaryng. 25:632-652 (June) 1937.

3. Saks, A. L., and Hyndman, O. R.: Intracranial Hypertension of Unknown Cause: Cerebral Edema, Arch. Surg. 38:429-442 (March) 1939.

operative day. The subsequent convalescence was uneventful except for a transitory mild left frontal headache. The patient was free from symptoms when dismissed on the thirteenth day after operation.

June 23, twelve days later, the patient was readmitted to the hospital complaining of pain in the left shoulder and left arm, intermittent headache and continuous "fuzzy" sounds referred to the right ear. There was pain referred to the right eye and orbit and there was some supra-orbital headache, which occasionally radiated over the vertex of the skull on the right side.

Examination of the ears revealed a large central perforation of the right drum with a small amount of serous discharge. There were a moderate amount of thick purulent discharge on the left side and also a large permanent perforation. The mastoidectomy wound appeared clean and was filling in with healthy granulating tissue. Except for an area 3.5 cm. in diameter of baldness on the scalp, general physical examination revealed an essentially normal status. The temperature on admission was 99.6 F. (rectal) and the pulse rate 80 per minute. Examination of the eyes showed them to be normal except for bilateral choked disks of 3 to 3.5 diopters with flame shaped hemorrhages and retinal edema. The visual fields were normal except for enlarged blind spots.

Spinal puncture performed June 30 revealed a pressure of more than 45 cm. of water. The fluid was clear and colorless and contained no cells. It contained 23 mg. of total protein, 750 mg. of chlorides (as sodium chloride) and 67 mg. of sugar (dextrose) per hundred cubic centimeters. The Wassermann and colloidal gold tests were negative.

Because of the intracranial hypertension, the patient's fluid intake was markedly restricted and magnesium sulfate was administered orally each day. July 2 a lumbar puncture revealed a pressure of 32 cm. of water. There was 1 cell per cubic millimeter, and attempted bacterial cultures were unsuccessful. June 3 there was an original spinal fluid pressure of 55 cm., and after 10 cc. of fluid was removed the final pressure was 28 cm. The Ayala index was calculated to be 5.1 but, as the patient was apprehensive and the original pressure varied from 43 to 60 cm. before any fluid was removed, it was questionable whether much reliance could be placed on the index.

The patient's course continued afebrile and the choked disks persisted despite the regimen of dehydration. She complained of occasional double vision and transitory pain in the right side of the face and behind the right eye. There was no paralysis of the external ocular movements.

Because of the persistence of the choked disks and even in the absence of cerebellar signs or of a visual field defect, it seemed wise to obtain a ventriculogram in the attempt to localize or exclude a brain abscess. Accordingly, July 12 ventricular estimation and attempted ventriculography were performed. With use of local anesthesia burr holes were made in each parieto-occipital region. Thirty-three cc. of fluid was obtained from the left lateral ventricle and 25 cc. from the right. This fluid was replaced by air. It was surprising that subsequent roentgenograms revealed no evidence of air in the ventricles but just a little air in the subarachnoid space under the burr holes.

The patient continued to have choked disks and blurred vision, and the spinal fluid pressure varied between 24 and 33 cm. of water. Except for persistence of the choked disks there were no neurologic abnormalities.

July 26 the reintroduction of needles into each lateral ventricle through the burr holes was attempted. The procedure was successful on the left side but unsuccessful on the right. At the same time, with the patient sitting upright, a spinal puncture needle was introduced into the second lumbar interspace. Approximately 150 cc. of spinal fluid was removed fractionally from the spinal subarachnoid space and a small amount of air was injected. During removal of the fluid, air was heard to be sucked in through the needle in the left lateral ventricle. Subsequent roentgenograms showed the left lateral ventricle filled with air and normal in size, shape and position, but none of the rest of the ventricular system was revealed. After this procedure the patient was drowsy and had transitory left facial palsy.

For the next two days she became very somnolent and ate but little. She preferred to curl up in bed and be undisturbed. From July 29 through August 1 the spinal fluid pressure varied between 30 and 49 cm. of water. Starting August 2 we insisted that the patient sit up in a chair most of the day. Her improvement in the next few days was striking. The sites of incision over the burr holes, which previously had been bulging, were now markedly flattened and the spinal fluid pressure was 12.5 cm.

August 7 the patient was asked to stay in bed on awakening until observations could be made. She had been sleeping all night on one pillow. At 7:52 a. m. there was considerable prominence of the skin over the burr holes. At this time the patient was asked to sit in a chair. There was no immediate change in tension of the skin. Three minutes later the skin over these incisions was beginning to soften and after ten minutes there were marked softening over the left burr hole and moderate softening over the right. At 9:08 a. m. the skin was flat over the left burr hole and very slightly bulging over the right. By 9:23 a. m. the skin over both trephine holes was flat. Later that day the patient was dismissed from the hospital with the advice that she take approximately seven glasses of fluid each twenty-four hours. She was to sit or stand up all day, and when she went to bed her head was to be elevated on three or four pillows.

When she was seen September 7, one month after dismissal from the hospital, her visual acuity without correction (A. M. A. chart) was 91.5 per cent in each eye. The right optic disk was flat. The left optic disk was marked by less than 1 diopter of papilledema nasally but none temporally. There was no definite pallor of either optic disk. The patient had no complaints and was generally in excellent health.^{3a}

COMMENT

Pneumoventriculography is necessary in differentiating this type of intracranial hypertension from that secondary to an abscess or tumor of the brain. When ventriculography was attempted in this case there was immediate extrusion of the air from the ventricles out to the subarachnoid space under the burr holes. This phenomenon has been observed previously⁴ and is of diagnostic value.¹ However, subsequent adequate roentgenograms of the ventricular system, often obtained by encephalography, are always normal in these cases.

In the literature it is frequently stated that there is some interference with the absorption of cerebrospinal fluid in patients with this syndrome. However, Sahs and Hyndman questioned this view because of the absence of dilatation of the ventricles and said "If this assumption is correct—that decreased absorption of cerebrospinal fluid is not the fault—only one other cause can remain, and that is swelling or edema of the brain." However, it must be recalled that damming the venous outflow from within the skull will also result in an increase of intracranial tension.

In a discussion of the paper of Davidoff and Dyke, Lawrence S. Kubie suggested that an elevation of systemic venous pressure might account for this syndrome. Accordingly the venous pressure of our patient was determined August 1, while the intracranial hypertension was still marked. In the antecubital fossa the venous pressure was 92 mm. (normal) and the circulation time was fourteen seconds. Another possible systemic factor that was considered was the osmotic pressure of the blood. Therefore a determination of the serum protein was made and found to be 7.4 Gm. per hundred cubic centimeters, a normal reading. There were 4.7 Gm. of albumin and 2.7 Gm. of globulin per hundred cubic centimeters of blood serum, and therefore there was no evidence of decreased osmotic pressure of the blood.

At the time of the mastoidectomy the left lateral sinus was opened and packed. This procedure could be expected to interfere with the venous outflow from within the skull and to increase intracranial pressure in two ways: (1) by increasing the amount of blood within the skull at any one time and (2) by interfering with absorption of fluid from the cerebral

3a. On Dec. 14, 1939, the optic disks were flat. The visual acuity was 100 per cent in each eye (A. M. A. chart) without glasses. The patient felt entirely well and lived normally.

4. Davidoff and Dyke.¹ Williams.² Sahs and Hyndman.³

modern school, such as Swift,² Klinge³ and others, is that both types of inflammation represent an allergic reaction to some antigen, presumably of a bacterial nature.

The symptoms in rheumatic fever result in great part from the inflammatory changes in the joints or in the heart. In adults, joint symptoms predominate; in children, symptoms referable to the heart are the more conspicuous. As a rule, symptoms of toxemia are more marked in adults than in children.

One of the most significant features of rheumatic fever is its close association with infections of the upper respiratory tract. In more than 50 per cent of cases the onset is preceded by tonsillitis or a sore throat. In others, there is a preceding history of sinusitis, otitis media, bronchitis or pneumonia.

TREATMENT

The treatment of rheumatic fever naturally falls into three divisions:

1. Treatment based on etiology.
2. Treatment based on pathology.
3. Treatment based on symptoms.

Treatment Based on Etiology.—Because of the great popularity of the streptococcus theory, a good many efforts have been made to develop a specific treatment for rheumatic fever. This has taken the form of streptococcus vaccine, nonspecific therapy, antistreptococcus serum and specific chemotherapy.

(a) The rationale of intravenous injections of streptococcus vaccine is based on the hypersensitiveness of rheumatic patients to streptococcus protein. The advocates of streptococcus vaccine have reasoned that, if the patient could be desensitized by a streptococcus vaccine, the rheumatic cycle could be shortened and the well known tendency to relapse lessened. The results, as reported by Wilson and Swift,⁴ have not been conclusive. It is obvious that vaccine therapy would be of little value in the acute type of rheumatic fever. The vaccine usually employed is prepared from some strain of *Streptococcus haemolyticus*. The initial dose should not be more than 25,000 bacteria, administered intravenously, and increases should be gradual. Severe reactions are contraindications to increased dosage.

(b) Nonspecific therapy still maintains considerable popularity in the treatment of infectious diseases, and a number of observers have demonstrated its value in the treatment of rheumatic fever and allied conditions. A number of years ago I showed that acute attacks of rheumatic fever could be quickly terminated by intravenous injections of typhoid vaccine.⁵ This finding has been corroborated by others. Sutton and Dodge⁶ have induced rapid disappearance of chorea by the same method. These writers also found that in some cases of rheumatic carditis the symptoms promptly disappeared after the intravenous injection of typhoid vaccine.

My present attitude toward nonspecific protein therapy is definitely conservative; protein therapy has obvious disadvantages and should not be employed except in cases in which safer methods of treatment

have failed. The initial dose of typhoid bacillus vaccine should be from 25 to 50 million intravenously for adults and 25 million or even less for children. Two or three injections are usually sufficient to bring about recovery.

(c) It has already been pointed out that the streptococcus origin of rheumatic fever has not been proved. The use of antistreptococcus serum, therefore, is a strictly empirical procedure. A polyvalent antistreptococcus serum has been recommended by Menzer⁷ and others but has not met with a favorable reception.

There is no evidence to prove that the serum of patients who have recovered from rheumatic fever has any therapeutic effect.

(d) The striking effects obtained with sulfanilamide in acute streptococcal infections have naturally suggested its use in the treatment of rheumatic fever. Promising results have actually been reported by some of the German clinicians, but experience in this country has not been favorable. It is quite possible that in those few cases in which sulfanilamide has induced recovery the patients were suffering from a frank streptococcal infection of the joints which simulated rheumatic fever.

Treatment Based on Pathology.—Pathologic changes which occur in rheumatic joints have already been briefly described. The acute inflammatory changes which occur in the joints must be treated like any other acute arthritis. The patient should be put to bed and kept there until at least two weeks after all symptoms have disappeared. Complete rest is the keynote of treatment for this condition, and too much rest is certainly preferable to too little. The affected joints should be wrapped in cotton covered with gauze. The limbs will be much more comfortable if supported by pillows, placed so as to flex partially the inflamed joints. If the joints are very tender, a cradle should be placed over the patient to protect him from the pressure of bedclothes. Splints are rarely necessary, as the pain and swelling are usually of short duration; but it is important that the painful joints should be moved as little as possible during the acute stage of the disease.

Local applications of various kinds are often useful in relieving the pain. A saturated solution of magnesium sulfate is easy to prepare and is very popular with some physicians. The wet dressing should be covered with rubber sheeting to prevent evaporation, and the bandages should be moistened frequently. Another favorite local application is a 10 per cent ointment of methyl salicylate made up in petrolatum. Some preparations contain menthol in addition to the methyl salicylate.

PRESCRIPTION 1.—Methyl Salicylate Ointment

	Gm. or Cc.	
R Methyl salicylate	10	℥ 3iiss
Menthol	2	℥ 3iiss
Petrolatum, q. s. ....ad	100	℥ 3iiss
Mix and make into an ointment.		
Label: Apply locally.		

Hot water bags are sometimes helpful but often fail to relieve the pain.

Physical therapy does not play an important role in the treatment of acute rheumatic fever. In cases in which the joint symptoms become subacute or chronic, diathermy, hydrotherapy and the application

2. Swift, H. F.: The Nature of Rheumatic Fever, *J. Lab. & Clin. Med.* 21: 551 (March) 1936.
3. Klinge, F.: Der Rheumatismus, Munich, J. F. Bergmann, 1933. (An excellent general review of the pathologic anatomy of the inflammatory rheumatic diseases and of the allergic hypothesis of their etiology.)
4. Wilson, May G., and Swift, H. F.: Intravenous Vaccination with Hemolytic Streptococci, *Am. J. Dis. Child.* 42: 42 (July) 1931.
5. Cecil, R. L.: A Report of Forty Cases of Acute Arthritis Treated by Intravenous Injection of Foreign Protein, *Arch. Int. Med.* 20: 951 (Dec.) 1917.
6. Sutton, Lucy P., and Dodge, Katherine G.: The Treatment of Chorea by Induced Fever, *J. Pediat.* 3: 613 (Dec.) 1933.

7. Menzer, Arthur: Serumbehandlung bei akuten und chronischen Gelenkrheumatismus, *Ztschr. f. klin. Med.* 47: 169, 1902.

of the infra-red and the ultraviolet rays may be in order. Massage and passive movements are contra-indicated for the joints in the acute form of the disease but may be of value in the chronic form, at which time the treatment becomes more like that for chronic arthritis than for rheumatic fever. In cases of sub-acute or chronic disease, fever therapy is often of value. This may be carried out by means of typhoid vaccine intravenously or by artificial fever induced by exposure to thermal lamps.

Treatment Based on Symptoms.—As already indicated, the first duty of the physician is to put the rheumatic fever patient to bed and to insist on complete rest. His second duty is to make the patient as comfortable as possible by the use of heat and other local applications. His third duty is the administration of drugs that will relieve pain and curtail the activity of the disease.

Diet.—The diet in rheumatic fever is the same as that for any acute infection. During the febrile stage a soft diet is indicated, but after the temperature and pulse have returned to normal the patient may be allowed to eat almost anything that does not cause untoward gastrointestinal symptoms.

Medicinal Treatment.—The various compounds of salicylic acid have constituted the standard treatment of rheumatic fever for many years and in most cases give remarkably quick and striking relief to the patient. The exact mode of action of the salicylates in rheumatic fever is not known. Swift believes that the beneficial effect of salicylates is not attributable to increased production of immune bodies against the infectious agent. The well known anodyne effect of salicyl compounds is undoubtedly a factor, but this does not explain the immediate effect of the drug on the fever and on the swollen joints. It is possible that the salicylates achieve their effect by some sort of desensitization. When salicylates are properly administered, the pain and swelling in the joints rapidly disappear and the temperature drops to normal within twenty-four to forty-eight hours.

PRESCRIPTION 2.—Sodium Salicylate and Sodium Bicarbonate Powders

		Gm. or Cc.	
R	Sodium salicylate } Sodium bicarbonate }	ãã	36 | 5ix
Mix and divide into thirty-six powders.			
Label: One powder in water every three hours.			

Sodium salicylate is the most popular of the salicyl derivatives. It should be administered every two to three hours, by mouth, in doses of from 1 to 1.3 Gm. (15 to 20 grains), combined with an equal amount of sodium bicarbonate, until the symptoms are under control.

Swift advises from 1 to 1.3 Gm. (15 to 20 grains) of sodium salicylate every hour for eight to ten doses or until the first signs of intoxication appear. The physician should be watching carefully for evidence of salicyl intoxication, as in many cases the therapeutic and toxic doses are not far apart. On the second day of treatment the same dosage may be continued or, if the patient is greatly improved or shows signs of intoxication, the dose may be cut to three fourths or one half of the previous dosage and continued at this rate until all signs of active infection have been absent for a week or ten days. The symptoms of salicyl intoxication are nausea, vomiting, ringing in the ears, distur-

bances of vision and delirium. Renal irritation is also a frequent toxic manifestation and is detected by urinalysis.

If sodium salicylate upsets the patient's stomach, acetylsalicylic acid may be substituted with advantage. In my experience this drug sometimes produces a better therapeutic effect than sodium salicylate. The dosage is the same as that for sodium salicylate.

Occasionally the symptoms of rheumatic fever are not controlled by salicylates. This, however, is quite unusual, and when no response is observed one should always suspect an error in diagnosis. Furthermore, the relief produced in rheumatic fever by salicylates does not always connote a cure of the disease. In many cases, particularly in children, some activity of the disease persists in the heart in the form of rheumatic carditis, and unless this is recognized severe cardiac damage may ensue.

Patients who show a gastric susceptibility to salicylates may tolerate rectal administration of from 120 to 180 cc. of a 2 per cent solution of sodium salicylate (10 grains in 1 ounce of water) two or three times a day. Intravenous injection of the salicylates has been advocated by some but possesses no advantage over simpler methods of administration.

In addition to the salicylates there are several other drugs which have achieved more or less popularity in the treatment of rheumatic fever. Among these are cinchophen and neocinchophen. The latter is less toxic than the former and for that reason is usually preferred. The physiologic effect of the cinchophen derivatives is similar to that of the salicylates. The dosage is about the same as that for the salicylates, from 1 to 1.3 Gm. (15 to 20 grains) every three or four hours. The toxic manifestations of cinchophen are urticaria and jaundice. In cases of severe intoxication a fatal acute yellow atrophy of the liver may develop. For this reason I feel that cinchophen and its derivatives should not be used for the treatment of rheumatic fever except when other remedies fail. When it is administered, the patient should be watched closely for jaundice and gastrointestinal symptoms.

Aminopyrine is another drug that can be used with striking effect in the treatment of rheumatic fever, and it acts more promptly in much smaller doses. It may be administered in doses of from 0.3 to 0.5 Gm. (5 to 7½ grains) from four to six times a day. After the symptoms have been ameliorated, the dosage is reduced to half the previous amount. When aminopyrine is used, the possibility of an idiosyncrasy to the drug must be borne constantly in mind. During the last few years a number of reports of cases of granulocytopenia following the use of aminopyrine have appeared in the medical literature. For this reason the leukocyte count of patients who are receiving the drug must be carefully followed. If the white count drops to four or five thousand, the drug should be immediately discontinued.

Morphine sulfate from 10 to 15 mg. (one-sixth to one-fourth grain) or codeine phosphate 30 mg. (one-half grain) may be administered either orally or by hypodermic injection for the immediate relief of pain.

In cases in which the physical examination and the electrocardiogram indicate severe cardiac damage, digitalis in some form will probably be necessary, especially for patients who show tachycardia or arrhythmia. Digitalis can usually be administered by mouth, and preferably in the form of the powdered leaf as a pill or

capsule. For adults the initial dose should be 0.5 Gm. ($7\frac{1}{2}$ grains), to be repeated in four hours and usually again four hours later, a total of 1.5 Gm. ($22\frac{1}{2}$ grains) in the first twelve hour period. After this, 0.1 Gm. ($1\frac{1}{2}$ grains) three times a day should be given until a therapeutic effect or some evidence of toxicity results. It is, of course, important that whatever digitalis is used should be of standard pharmacopeial activity as determined by biologic test. Digitalis is contraindicated for those patients whose electrocardiogram shows evidence of heart block.

The dosage of digitalis for children should be only slightly less than that for adults.

Treatment of Complications.—Detailed discussion of the various complications of rheumatic fever would carry us beyond the scope of this article. In patients in whom cardiac decompensation with edema develops digitalis therapy may have to be supplemented by the use of diuretics, such as theobromine 0.5 to 1 Gm. ($7\frac{1}{2}$ to 15 grains) or theophylline 0.3 to 0.5 Gm. (5 to $7\frac{1}{2}$ grains). An even more effective diuretic is mercupurin administered intravenously in doses of 1 to 2 cc. in adults and 0.5 cc. in children. In case of pleurisy or pericarditis with effusion, thoracentesis may be necessary if there is an excessive amount of fluid. In advanced cardiac decompensation with cyanosis, administration of oxygen through a nasal catheter or, better still, by means of the oxygen tent is a valuable measure not only for giving comfort to the patient but also in correcting faulty ventilation in the lungs.

Treatment During Convalescence.—The duration of convalescence will be roughly proportional to the length and severity of the illness. The after-care of the rheumatic fever patient is of the greatest importance, the main problem being to avoid relapses and further recurrences of the disease. After antipyretics have been withdrawn, the patient should remain in bed for two or three weeks after all symptoms of infection have disappeared. At the time the patient first gets out of bed the weight should be normal, the pulse slow and regular, the leukocyte count under 10,000 and the sedimentation rate of the red cells not over 20 or 25.

The anemia that follows acute rheumatism in children will require particular attention during convalescence, and for this chief reliance should be placed on the use of arsenic, iron and the ultraviolet rays. Solution of potassium arsenite 0.065 cc. (1 minim, increased to 5 minims or 0.32 cc. three times a day) is helpful. Reduced iron 0.6 Gm. (10 grains) three times a day and iron and ammonium citrate 0.5 Gm. ($7\frac{1}{2}$ grains) are the least irritating of the various iron products. Some physicians prefer to administer iron and arsenic intravenously in the form of iron cacodylate.

Particular care must be taken to avoid strain to the heart. The opinion is now generally held among students of rheumatism that in cases of cardiac involvement the severity of the heart lesions will be much less in those treated by rest than in those not so treated. To prevent chronic rheumatic disease of the valves or muscle of the heart the patient must be kept at rest as much as possible for several months, abstaining from emotional excitement and violent exercise of all kinds. It is often difficult to enforce sufficient rest on these patients, particularly among children and the less intelligent classes. In the case of children, the proper enforcement of rest will depend largely on the intelligence and cooperation of the mother.

CONVALESCENT HOMES

For the subacute phases of rheumatic fever an important part of modern therapy is sanatorium treatment. Some of the larger cities in the United States now have institutional facilities for the care of children who are in the subacute, chronic or convalescent stage of the disease. Rest, sunlight, regulated life, adequate diet and medical supervision are the major advantages of this form of treatment. Experience shows that rheumatic children do well in these convalescent homes, though just what the end results of such institutional care may be is a different question and a more difficult one to decide. In England, Campbell and Warner⁸ have published statistics to show that they are favorable. McCulloch,⁹ however, from a careful analysis of several hundred children, found that, although the incidence of relapses was greatly reduced during sanatorium treatment, the number of recurrences subsequent to sanatorium care was actually greater among children sent to sanatoriums than it was for children who were allowed to remain at home.

PREVENTIVE MEASURES

The well known tendency of rheumatic fever to recur renders preventive treatment one of the most important aspects of therapy. Once a child has rheumatic fever, there is no sure way of preventing cardiac damage. However, in many cases the amount of damage inflicted by the first attack is minimal and can be completely outgrown if the after-care of the patient is properly controlled. With each recurring attack of rheumatism the injury to the valves and heart muscle is increased. The physician, therefore, is not doing his full duty if he does not make every effort to prevent these recurrences.

Focal Infection.—In view of the close association of rheumatic fever with tonsillitis and other infections of the upper respiratory tract, careful investigation should be made for focal infection in this region. Tonsils showing any evidence of disease should be removed promptly. Indeed, many physicians make it a rule to have the tonsils removed in every case of rheumatic fever, regardless of their appearance. However, the removal of tonsils provides no guaranty against subsequent attacks of rheumatism. Kaiser¹⁰ has analyzed a large group of school children regarding the effect of tonsillectomy on the incidence of rheumatic fever. In this study he showed that about one third more children had their first attack of rheumatism when their tonsils were in than those whose tonsils were out. Kaiser also found that the fatality rate of rheumatic fever was nearly 50 per cent less in children whose tonsils had been removed before the initial attack. However, Ingerman and Wilson¹¹ found very little difference between tonsillectomized and nontonsillectomized children. In the former group 76 per cent showed recurrences of rheumatism; in the control group 80 per cent showed recurrences. Swift sums the problem up very well when he says that "while the few available statistics do not show any great advantage from tonsillectomy from either the prophylactic or the curative

8. Campbell, Maurice, and Warner, E. C.: A Study of Rheumatic Disease in Children, *Lancet* 1: 61 (Jan. 11) 1930.

9. McCulloch, Hugh: Rheumatic Heart Disease: Its Importance as a Disease of Children, *J. A. M. A.* 90: 2973 (June 30) 1928.

10. Kaiser, A. D.: Children's Tonsils In or Out, Philadelphia, J. P. Lippincott Company, 1932; Factors That Influence Rheumatic Disease in Children, reprinted with additions, from *J. A. M. A.* 103: 246 (Sept. 25) 1934.

11. Ingerman, Eugenia, and Wilson, May G.: Rheumatism: Its Manifestations in Childhood Today, *J. A. M. A.* 82: 759 (March 8) 1924.

standpoint, the figures are at present too meager to permit a final judgment, and it is probably best to give the patient the benefit of the doubt."

The sinuses and teeth should also be investigated for possible infection. Most important of all is the prevention of acute pharyngitis and coryza. Children with a tendency to rheumatism should be carefully protected against exposure to cold and dampness. Sleeping in wet clothing or getting chilled when fatigued predisposes to respiratory infection with possible rheumatic sequelae.

Climate.—Recent studies have shown that climate plays an important part in the incidence and recurrence of rheumatic fever. Coburn¹² has found that when patients with active rheumatic disease are transferred to Puerto Rico they remain free from infections of the upper respiratory tract, and all manifestations of rheumatism subside. However, when these children return to a northern climate many of them again contract respiratory infections, which in most incidences are followed by the reappearance of rheumatism.

The logical method of preventing recurrences of rheumatism would be to transport rheumatic children to the tropics and keep them there through the cold season, but for economic reasons such a solution is not generally practicable.

Prophylactic Vaccination.—For children who cannot have the advantages of a tropical climate, prophylactic inoculations with streptococcus vaccines are well worth trying. Wilson and Swift found that rheumatic children, vaccinated in the fall and early winter, had fewer relapses than a control group. This immunity, however, was not adequate two years later. In my experience, streptococcus vaccine must be given every year, preferably during the winter and spring months, if adequate protection is to be secured.

Personal Hygiene.—Numerous studies have shown that rheumatic fever is a disease of the underprivileged. For this reason the rheumatic child should have the benefit of the best personal hygiene. This would include sanitary housing, warm clothing, plenty of outdoor exercise, sunlight and nutritious food. The studies of Rinehart¹³ on the relation of vitamin C to rheumatic fever have suggested the possibility that a vitamin C deficiency might be a factor in the etiology of the disease. However, the administration of vitamin C in large amounts does not appear to shorten the disease or to prevent relapses. The whole subject of vitamin therapy in rheumatism is still in the investigative stage.

Chemotherapy.—Coburn and Moore¹⁴ have recently published an interesting study on the value of sulfanilamide in the prevention of rheumatic fever. Rheumatic children were given maintenance doses of the drug (about 2 Gm. daily) over a period of months and observed with respect to the incidence of hemolytic streptococcus infections and recurrences of rheumatic fever. No toxic effects from the drug were observed. Only one of the twenty-six patients so treated contracted an infection with hemolytic streptococci in the throat flora and only one of the twenty-six highly

susceptible rheumatic children developed active rheumatism. However, sulfanilamide administered to rheumatic subjects after the onset of streptococcal throat infections did not prevent rheumatic recurrences. This important contribution to the prophylaxis of rheumatic fever seems to offer real promise as a practical measure of preventing recurring attacks of the disease.

33 East Sixty-First Street.

CONFERENCES ON THERAPY

ROUTES OF ADMINISTRATION OF DRUGS

NOTE.—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.

DR. HARRY GOLD: The conference this morning is to deal with the routes of administration of drugs. We might do well to confine the discussion to drugs employed for their systemic action. There is hardly a tissue barrier in the body which is not used at one time or another for the transport of a drug into the circulation—the small intestine, the sublingual tissues, the rectal mucous membrane, the intact skin, the subcutaneous tissue, the muscle, the nasal mucosa, the vaginal mucous membrane and the spinal canal. Sometimes we get around all barriers and put the drug directly into the circulation, intravenously, intra-arterially or intracardially.

All factors being equal, I think we should probably agree that the oral route is the method of choice for the administration of drugs, as it is for the administration of food. The only trouble is that not all factors are equal, and there are circumstances under which it is desirable, or even imperative, to use some method other than the oral route. If one departs from the oral administration of a drug, one ought to have a pretty good reason for doing so, and I think that the general practice in that respect can be divided into three classes:

In the first class the validity of parenteral administration is supplied by common sense. I think it is nothing more than that. One does not give the drug by mouth because the patient is unconscious, because he vomits, because he will not cooperate or because an emergency exists and one cannot wait for absorption.

In the second class, the parenteral administration of drugs depends on the results of sound pharmacologic experiments. There are innumerable examples in this class: One gives epinephrine by injection and not by mouth for very good and sufficient reasons based on pharmacologic facts; similarly for pituitary extracts by injection and also calcium salts, usually by intravenous injection. Bismuth subsalicylate in the treatment of syphilis is given by intramuscular injection, and not by mouth, because the object of treatment is to obtain a slow stream of bismuth entering the circulation over periods of weeks, sometimes months, and there is no other way to achieve that. Again, morphine sulfate is usually administered by subcutaneous injection rather than by mouth, and perhaps the reason for that is well known to you. It is relatively slowly absorbed from the intestinal tract; the analgesic action is brief, the general depressant action is long. To secure sufficient

12. Coburn, A. F.: *The Factor of Infection in the Rheumatic State*, Baltimore, Williams & Wilkins Company, 1931.

13. Rinehart, J. F.; Connor, C. L., and Mettler, S. R.: *Further Observations on Pathologic Similarities Between Experimental Scurvy Combined with Infection and Rheumatic Fever*, J. Exper. Med. 59: 97 (Jan.) 1934.

14. Coburn, A. F., and Moore, L. V.: *The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever*, J. Clin. Investigation 18: 147 (Jan.) 1939.

analgesia by the oral route requires doses which cause unnecessarily prolonged depression.

Those, then, are the first two classes. The first depends on common sense and the second on pharmacologic experiments. There is a third class of practice which possesses no validity at all on the basis of our present knowledge. I now refer to the very widespread practice of giving common drugs by injection when the effective, less dangerous and less costly oral route is available. Not a vestige of evidence exists at the present time to justify the courses of injections of iron, cacodylate, iodides, bromides, salicylates and a host of other agents, frequently so given. A very large proprietary industry thrives on the doctor's predilection for the injection of agents that can be satisfactorily given by mouth.

When the question arises as to whether one should give a drug orally or intravenously when it can be given by either route, there is a tendency to assume that nothing more is involved than the matter of convenience of administration or speed of action. There are some important fundamental factors involved here which have received but little consideration. I want to mention one of them. If an animal is given a dose of atropine sulfate, say 50 mg. per kilogram, at one time intravenously, it will die almost immediately from circulatory collapse. If one gives the animal atropine sulfate much more slowly by subcutaneous injection, by mouth or even by repeated small intravenous injections, it requires a very much larger dose to kill the animal; but more than that, death takes place by a different mechanism. It dies now not from circulatory collapse at all but from paralysis of the myoneural junctions in the muscles of respiration. Another illustration with similar significance: If one injects a small dose of quinidine sulfate intravenously, one produces marked changes in the heart as shown in the electrocardiogram. However, one can give very much larger doses of quinidine by oral administration or by intramuscular injection, and one can kill the animal by these larger doses, producing convulsions, however, without any changes in the electrocardiogram. In short, it is not only a matter of convenience or speed of action. The pattern of action of a drug is not necessarily the same when given orally as when given intravenously. The difference is due to the difference in the concentration of the drugs in the circulation in the two cases, since the distribution of the drug to various organs of the body depends in a large measure on the concentration in the blood stream.

How these matters stand in clinical therapy at the present time one can hardly surmise, for they have not been explored.

We cannot do much more this morning than to thrash out the pros and cons of the administration of some of the more common and important drugs that are used in therapeutics. Dr. Eggleston will lead the discussion.

THE CARDIAC DRUGS

DR. CARY EGGLESTON: In the problems facing us in the administration of cardiac drugs, all of those touched on by Dr. Gold are represented. However, we can concentrate our attention, I think, on certain of those problems because of their greater frequency and greater importance.

It is my purpose not to discuss the actions of digitalis, or even the dosage of digitalis or of its various bodies

and representatives, but to discuss the administration of these cardiac drugs as we face the problems in the treatment of cardiac failure.

Of course, the digitalis group heads the list when we speak of cardiac drugs. Here there is no question that the route of choice, the route *par excellence*, is the oral route. In this connection we have to consider a number of problems: first the availability of the drug, then its uniformity, potency and absorbability, the uniformity as well as the rate of absorption, the duration of action, the cost, and finally minor problems such as the side actions of the drug and the ease of administration. But practically all of these desiderata can be met in the case of digitalis by the simplest representative of the entire group, the powdered leaf. This is available, inexpensive and readily absorbed, it is today of fairly uniform potency and high activity, the rate of absorption is satisfactory for the majority of patients, it is easily administered, and the duration of its action is well within the limits of desirability. For the oral administration of digitalis, as I have said, the powdered leaf is apparently the most desirable of all preparations as yet available. The dose is not too large. It can be administered in tablet form or in capsules or may be given as powders, although that is inconvenient. Pills are used, but much less commonly than the tablet or capsule. The powder may even be incorporated in suppositories, which I shall discuss in a few moments. The powdered leaf has the advantage of keeping well, although the tincture is not bad as to keeping properties. The dose is small in bulk but not too small for easy handling. The powdered leaf, once standardized, can be administered in terms either of weight or of its biologic activity. These, therefore, lead to the choice of the powdered leaf as the form of primary value. When given by mouth, absorption is complete in about six hours. Its duration of action varies, of course, with different individuals and with different preparations of the leaf and under circumstances some of which are not well known; but in general the duration of action is sufficiently long so that doses do not have to be repeated too frequently. It is usually satisfactory for maintenance purposes to administer a dose but once daily. This does not embarrass the patient and he is not as likely to forget it as he would be if he had to take repeated doses.

The powdered leaf can generally be taken by patients even in the presence of the minor degrees of nausea which are occasionally associated with acute congestive heart failure, although at times this constitutes a barrier. There are certain psychic barriers which we must consider in the administration of digitalis orally. Most frequently they occur in a patient to whom digitalis has been administered unwisely so that nausea and vomiting have been induced. Sometimes such a patient believes himself utterly incapable of taking digitalis in any form, and occasionally this constitutes a real barrier to the administration of the powdered leaf, the tincture or any other preparation with a name implying digitalis with which the patient has been familiar. We then occasionally have to resort to subterfuges and employ other preparations, of which I shall speak briefly.

Psychic nausea or vomiting usually can be avoided by administering the powdered leaf by rectum in the form of a suppository or as the galenic preparations of the powdered leaf, such as the tincture. The dose by rectum and the rate of absorption are not materially

different from those by mouth. There may be minor variations. The rectal dose will perhaps have to be a little larger and occasionally a little less; however, this varies in individuals and is not a matter of major importance. Instead of resorting to the rectal route of administration we may use some of the newer more or less purified glucosides of digitalis or of its congeners, and for this purpose uginin, which is a mixture of the two active glucosides of squill, may be employed satisfactorily. It has the advantage of carrying no implication in its name that it is related to digitalis.

Amorphous gitalin, which was introduced under the trade name verodigen, may also be employed.

You may wonder why we do not resort immediately to parenteral methods of administration to avoid this psychic nausea or vomiting. This is primarily because we can avoid it without having to resort to the parenteral methods, and these methods with one exception are relatively unsatisfactory for the administration of digitalis.

The subcutaneous route should never be employed, I believe, primarily because all of the digitalis bodies that are potent are intensely irritating to the subcutaneous tissues; I have seen more than one instance in which they have been so given by error or intent and have resulted in very severe cellulitis or even in local necrosis of the tissues. Along with these inflammatory reactions the patients have suffered rather intense pain, often requiring morphine for relief.

The intramuscular administration of digitalis bodies is an available route but one which is frequently abused, in my opinion. It is most commonly used in the hope of hastening absorption or of making sure of digitalization. I believe that this is a genuine error because in my experience the digitalis bodies are neither as uniformly nor as rapidly absorbed from intramuscular administration as they are after oral administration. Intramuscular injection produces much less local irritation than subcutaneous administration, but with some patients it is significant. Occasionally for unconscious patients and under other circumstances it may be necessary or desirable to resort to intramuscular injection. For this purpose we may use such partially purified preparations as digitan or digifoline, or we may resort to the strophanthins. Frankly, I have found very little need for intramuscular administration.

Intravenous administration, however, constitutes a method of great value in a very limited number of cases. There is only one agent which in my personal experience is sufficiently trustworthy and well understood to permit me to recommend it, and that is crystalline strophanthin gratus (ouabain). One may also employ the amorphous strophanthins, but these are less active and appear to be less stable, and I myself have not found them as desirable as ouabain. The indications for the resort to intravenous ouabain therapy I believe are summed up by saying that it may be valuable when one is faced with a grave emergency and the patient has not previously been receiving digitalis. The total dose of ouabain for this purpose is approximately 1 mg. for effective digitalization. This total dose had best not be given in a single administration. It is wiser to give half of that dose, 0.5 mg., initially. The action is prompt. The injection should be reasonably slow and in sufficient dilution, say 10 cc. About five or ten minutes should be allowed for the injection. The actions will be manifest, if they are to appear, within fifteen to thirty minutes and will be fairly well devel-

oped by the end of an hour or possibly two, when one can judge effects sufficiently accurately so that subsequent fractions of the total dose of 1 mg. may be added at intervals of one-half to one or two hours, to secure adequate digitalization.

The objections to the intravenous use of ouabain, aside from those mentioned by Dr. Gold, are that it does not seem justifiable to continue treatment by this route; the action is fairly brief, and to maintain digitalization it would be necessary to give two or three doses or more in twenty-four hours. This is scarcely justifiable except as an emergency measure, and even then one should begin to administer digitalis by the intestinal tract, by mouth or by rectum so as to pick up and maintain action.

The next group of drugs of importance in heart disease is the diuretics, and these can be passed over briefly as to their routes of administration. The various members of the purine family, theophylline, theobromine with sodium salicylate, theocalcin and the like are all best administered by mouth for the purpose of producing diuresis. None of these are too well borne by the gastrointestinal tract, and nausea and vomiting may result and constitute a problem in their further administration. Theophylline with ethylene diamine (aminophylline) is occasionally of some value intravenously for the specific purpose of checking Cheyne-Stokes respiration or cardiac asthma, when its action is exceedingly prompt. Other diuretics in this group need not be mentioned.

The mercurials constitute the most important group of present day diuretics, and these are best administered intravenously to avoid their local irritant actions. They are quite irritant to the local tissues when injected subcutaneously. When the mercurials, either mercupurin or salyrgan (mersalyl), contain an added amount of theophylline (mercupurin is a combination of mercurin with theophylline), their local irritant effects are materially reduced, and they may, if necessity dictates, be administered intramuscularly. The mercurial fraction of mercupurin as well as mersalyl can be administered successfully by suppository, but in many instances this produces so much local discomfort in the rectum that the patient is unwilling to continue their use. Hypertonic solution of dextrose is scarcely a drug, and it must be administered intravenously for diuretic purposes. Urea is administered by mouth. Other diuretics are of small value.

Dr. Gold has saved me a good deal of time in discussing the question of the sedatives and hypnotics. He has already spoken of morphine, which is I believe the most important sedative for the cardiac patient, and I quite agree with him that it should be administered subcutaneously. Substitutes for morphine are available, such as dilaudid, pantopon and codeine. My own experience leads me to favor morphine over all these substitutes. Other sedatives are primarily administered through the gastrointestinal tract and embrace such agents as hydrated chloral, which is far too irritant and which has too large a dose, to permit of its being administered in any other way than through the digestive tract. The bromides and the soluble barbiturates may both be administered intramuscularly. Paraldehyde should be given by rectum or by mouth.

The nitrites should also be given orally or by inhalation. If orally the best is glyceryl trinitrate and its administration is best under the tongue, whence it is absorbed with great rapidity and effectiveness. Amyl

nitrite is, of course, administered by inhalation. It smells bad to many and its administration is not readily controllable in any event.

Quinine and quinidine are ordinarily most conveniently administered orally. They may on occasion be administered intravenously but very slowly and in very dilute solution.

One final preparation deserves mention, and that is acetyl-beta-methylcholine, which is administered subcutaneously and is resorted to only as an emergency remedy for the checking of a paroxysm of auricular tachycardia.

DR. GOLD: We shall reserve discussion until the latter part of the conference. Dr. Shorr, will you discuss the modes of administration of the sex hormones?

SEX HORMONE PREPARATIONS

DR. EPHRAIM SHORR: Since it is the intention in this conference to discuss not the therapeutic indications for the use of the sex hormones but merely the choice of modes of administration, I shall confine what I have to say to the latter aspect.

There are two groups of hormones which are employed in dealing with problems of sex physiology in the human being.

The first comprises those whose purpose is to stimulate the gonads into activity when function is either absent or subnormal. These are called gonadotropic hormones and are obtained from three sources.

The first source is the anterior pituitary gland, from which an extract with definite gonadotropic activity in animals has been prepared. It is protein-like in character and still crude from the chemical point of view. It is meant for subcutaneous administration and is practically always employed by this route.

The second type of gonadotropic preparation is obtained from the serum of pregnant mares. It is available in a much more purified state than the gonadotropic principle from the anterior pituitary. This hormone may be given subcutaneously, intramuscularly and intravenously. This last route is recommended because it brings the hormone in considerable concentrations into the blood stream in a short time and may prove the most economical way of bringing about an effect.

When mare serum hormone is given subcutaneously or intramuscularly there appears to be little local or general reaction, so that large doses can be given with safety. If the intravenous route is employed, an effort should be made to ascertain whether or not any undue sensitivity exists in the individual patient. This can be done by skin testing. I have encountered a number of reactions in patients even though skin tests were negative, but they were fortunately mild. They consisted of a flush lasting about five minutes, and in some instances urticaria.

The third type of gonadotropic hormone is derived from pregnancy urine. This is the chorionic gonadotropin and is, like the pituitary extract, still too crude to use intravenously. Its use is frequently associated with local reactions which take the form of redness and swelling, or general reactions such as malaise, elevation of temperature and generalized aches and pains. For these reasons it is desirable to start with low doses and to work up gradually to the desired maximum. In this way unpleasant reactions can be avoided. These precautions hold for both pregnancy urinary extracts and extracts of the anterior pituitary.

The second form of therapy is of the substitutional type and consists in the administration of the hormones, elaborated by the gonads when insufficiency exists. Turning first to the secretions of the ovary we find four available. Three belong to the group of estrogens. They are estrone, estradiol and estriol. The first two are suitable for parenteral and oral use and the last for oral use.

The most common mode of administration of estrone and estradiol is intramuscular. The reasons for this lie in loss of potency when administered orally. Both these compounds lose anywhere from 90 to 95 per cent of their activity when given by mouth. One can, of course, take this loss of efficiency into account and correct for it. When this is done the full therapeutic dose may be given by mouth. At the moment it is a matter of economics and awaits an improvement in chemical methods which will reduce the cost of these preparations.

Estriol (theelol) is also effective by mouth but the amounts of the present commercial preparations that are feasible to use are too small to benefit most of the patients with a menopausal syndrome. More recently several workers have implanted crystals of estradiol with very beneficial effects. The hormone is slowly absorbed and a small amount lasts a long time. One disadvantage to be considered as regards this method of administration is the possibility that its use for patients with intact uteri may bring about continued hyperplasia of the endometrium which may lead to bleeding difficult to control.

The estrogens are very useful in the form of vaginal pessaries in the treatment of local conditions such as senile and gonorrheal vaginitis, when the therapeutic aim is not the general effect of the hormone but a local action on the vaginal mucosa, to induce hypertrophy and resistance to infection.

The fourth hormone elaborated by the ovary is the progestational one, progesterone. It is given intramuscularly in oil. A derivative with progesterone-like action, pregnenolone, is available for use by mouth, and gives promise of being effective by this route.

The androgenic hormones, of which the most generally used form is testosterone propionate, are at present chiefly employed in an oily vehicle by the intramuscular route. They apparently lose even more of their effectiveness when given by mouth, so that the oral route is out of the question at present. A derivative, methyl testosterone, may prove to have a greater oral efficiency, but the factor has not as yet been worked out.

More and more, the advantages of pellets implanted subcutaneously are becoming recognized. This mode of administration has the disadvantage of necessitating a minor surgical procedure, but it has the great advantages of prolonged and sustained action and economy.

I should like to mention briefly a synthetic estrogen, stilbestrol, which is inexpensive, highly active, and loses but little of its efficiency when given by mouth. Its use in this clinic has, however, been associated with so many toxic effects that we consider it potentially dangerous and undesirable for human use, certainly until more is known of the nature of the side reactions.

DR. GOLD: Dr. Washington, will you discuss these problems from the standpoint of pediatric practice?

ADMINISTRATION OF DRUGS TO CHILDREN

DR. JOHN A. WASHINGTON: In pediatrics we use about the same drugs that are used in adult medicine. Any differences lie in methods of administration and

of course in dosage. Differences in administration are based less on physiologic considerations than on practical considerations having to do with the ability of the patient to swallow or retain the drug. In the first place, we are not usually able to give rectal instillations or suppositories to infants and small children because these patients will not retain them. By strapping the buttocks with adhesive tape it is possible to make use of quickly absorbed drugs, such as avertin with amylene hydrate, with some degree of success, but even with this strapping some loss of the instillation usually occurs. The oral route therefore must be heavily relied on.

Here there are certain limitations peculiar to pediatrics. In the first place, we can't use pills for infants and small children. Infants will usually spit them out. Small children will chew them up, which usually results in more or less spitting when the taste is appreciated. Consequently, medicines for these patients must be in a dissolved form or at least suspended in a liquid. Infants will swallow unpleasant tasting liquids to a surprising extent.

However, this does not always happen. It is when they begin resisting that our difficulties begin. By holding the nose an experienced nurse can usually get almost any dose down. In the home, however, one can never be sure how much a sympathizing mother will manage to get into a young child. Besides the danger of a struggling child's not getting the drug down, there is always the danger of his aspirating some. If the substance is oily and if the performance is repeated often, the danger of lipoid pneumonia developing is very real.

A number of drugs are used both by mouth and hypodermically. Some of the reasons for resorting to the use of a needle can be illustrated by the administration of calcium compounds in infantile tetany. When convulsions are occurring or, even worse, when laryngeal spasm is present, getting calcium and a sedative into the patient is an emergency measure. Most calcium compounds are rapidly enough absorbed after oral administration, but a baby with tetany cannot be counted on to swallow the medicine, and one does not want to increase his spasm by the struggle which accompanies forcing it. I know one experienced pediatrician who prefers to pass a small catheter into the stomach and put a solution of calcium chloride and the sedative through that. The usual procedure, however, is to use a solution of calcium gluconate intramuscularly. This involves no more disturbance than passing a catheter and has an added advantage in that the drug can't be vomited. With the relief of the spasm, which is usually prompt, one can continue the treatment with oral doses.

The technic of administering drugs intravenously is different from that in adult medicine, chiefly in that there are no prominent veins in the antecubital fossae. In the skin of the scalp, however, there are a number of superficial veins which can be entered with surprising ease. To do this one has to shave a patch of the scalp. In the hospital this is done often, more for the administration of fluids of course than of drugs. Babies with diarrhea often receive several infusions a day for a number of days.

Through these veins the newborn babies with acute syphilis can be given their first arsenic injections. When these patients are discharged to the outpatient clinic they are not usually subjected to this scalp-shaving procedure, and intramuscular injections are relied on until veins develop in their antecubital spaces.

I might mention here that the inunction method of giving mercury in congenital syphilis has in many clinics been abandoned, and bismuth injections have been substituted. One good reason for this is that one could never be sure how conscientious the mother might be in giving the rubs.

DISCUSSION OF QUESTIONS

DR. GOLD: The conference is now open to general discussion.

DR. EUGENE F. DU BOIS: I should like to bring out a practical point about the tincture of digitalis, which was the form used about ten years ago. A good many men do not realize the enormous difference between the drop and the minim of a tincture. I think the general practitioner usually considers that they are synonymous when as a matter of fact it takes about $2\frac{1}{2}$ drops of the tincture of digitalis to make 1 minim.

DR. WALTER MODELL: There is a standard minim dropper.

DR. EGGLESTON: That measures the minims but does not drop them. Apparently, there is no standard method for dropping which will secure uniformity in the measurement of an alcoholic preparation. Furthermore, Dr. Du Bois's question brings up a feature of undesirability of the tincture and other fluid preparations of digitalis in that the responsibility for measurement generally devolves on some one in the home who is not trained and rarely can measure accurately, even if provided with measuring utensils.

DR. GEORGE A. SCHUMACHER: I want to ask the conference a question in regard to the use of sedatives for cardiac patients. The problem frequently comes up in the ward of elderly patients with cardiac insufficiency who also have cerebral arteriosclerosis. Such patients are often restless and irritable and hard to control. Sometimes when they are in the oxygen tent they beat on the sides of the tent and try to get out, and we want to keep them at rest as much as possible. We want to keep away from the barbiturates in those cases. We are told that bromide and chloral hydrate are preferable sedatives for those patients, but on the other hand we are also told that chloral hydrate is a rather dangerous myocardial depressant, so we are oftentimes left not knowing what to do.

DR. EGGLESTON: I believe that this idea about chloral hydrate being a dangerous myocardial depressant is rather exaggerated if it is given in reasonably conservative doses and the dosage gaged by the effects and kept at the desired level. When that is done ill effects are very unlikely to occur. When chloral hydrate is combined with bromide its action is sometimes more lasting and the amount to be used can be reduced. Here is a particularly useful field for paraldehyde. Paraldehyde has only two objections: inconvenience of administration on account of its physical properties of taste and smell, and its persistent odor on the breath no matter how administered. These are very minor under circumstances such as you have mentioned, and so far as I am aware paraldehyde is virtually nontoxic in sedative doses. We have a patient upstairs now who has been taking between 70 and 130 cc. of paraldehyde in twenty-four hours over a period of several months without any detrimental effects whatever. It is the only thing which keeps him quiet.

DR. GOLD: It might be well for us all to taste a solution of chloral hydrate. It has a very disagreeable taste and it is quite irritant. It behaves like a lini-

ment; in fact, together with some camphor it makes a pretty good liniment. We ought to be sure its taste is well masked with syrup of orange peel and that it is well diluted before giving it. I have seen disaster following chloral hydrate in a case of cerebral hemorrhage in which the bleeding was resumed as the result of the vomiting from an insufficiently diluted solution.

DR. EGGLESTON: In dilute form it can be administered by rectum very successfully.

DR. ADE T. MILHORAT: I think that electrophoresis should be mentioned as a mode of administration. That certain substances can be so introduced into the organism is shown by the general systemic effects produced when electrophoresis is applied locally. The term "iontophoresis" is somewhat unfortunate and serves no useful purpose. The principles underlying this method are imperfectly understood, and the methods employed frequently are unsatisfactory and even crude.

DR. McKEEN CATTELL: I should like to ask Dr. Eggleston how it happens that ouabain is the glucoside of choice for intravenous administration. It would seem to be at the wrong end of the scale with reference to the rapidity of elimination.

DR. EGGLESTON: Perhaps I had better say drug of choice for me. I feel that it probably is the drug of choice in the present state of our knowledge of the glucosides of the digitalis family because it appears to be the one which, being crystalline, is most nearly uniform in its composition and activity, although possibly some of the newer crystalline glucosides derived from digitalis, such as digitoxin (digitaline native) may supplant it. However, most of those are not as readily soluble, or not as soluble in water or in physiologic solution of sodium chloride, as is ouabain. Finally, our experience with ouabain has been very extensive, so that we have come to know both its indications and its limitations, I believe, much more satisfactorily and thoroughly than is true of any other of the digitalis glucosides. The other strophanthins are for the most part impure and amorphous, and unless they are biologically assayed they cannot be used with the same sense of assurance and the same degree of reasonable safety as ouabain can. I might add as a matter of interest for the students that I have not given nor have I seen given in my services at this hospital or at Bellevue Hospital a single intravenous administration of ouabain in several years, so it is not very necessary.

DR. CATTELL: Perhaps this is an appropriate place to emphasize an elementary principle which in certain instances determines the route of administration of drugs. In general, the intensity of drug action is proportional to the concentration attained in the blood stream and this in turn is dependent on the relationship between the rate of absorption and the speed of elimination. The dose of substances such as the digitalis glucosides or barbitals, which are eliminated slowly, is of the same order regardless of the route of administration; on the other hand, when elimination is rapid, such as is the case, for example, with epinephrine and acetylcholine, an effective concentration in the blood can be attained only by a route which introduces the drug into the circulation rapidly.

DR. JANET TRAVELL: I should like to comment on Dr. Eggleston's statement that glyceryl trinitrate is absorbed with great rapidity when placed under the tongue.

It has long been recognized that some drugs, especially morphine, are absorbed faster when held in the mouth than when swallowed. However, there seems to be no clear statement in the literature as to what types of drugs can be absorbed better from the mouth than from other parts of the gastrointestinal tract. By "better" I mean that absorption may be either faster or more complete.

One of the digitalis bodies, strophanthin, has been studied in this respect. Some years ago Dr. Eggleston reported that strophanthin, which is poorly and irregularly absorbed when given orally, also produced no demonstrable effects on patients when placed under the tongue. However, we do not know the reasons for the very poor sublingual and gastrointestinal absorption of this glucoside.

There is one class of compounds, namely the alkaloids, which experiments in our laboratory have indicated should be absorbed much faster when retained in the mouth than when swallowed. We have shown that the hydrogen ion concentration plays an important role in the absorption of alkaloids from the gastrointestinal tract. A high degree of gastric acidity will completely prevent their absorption from the stomach, whereas absorption occurs rapidly in the nearly neutral intestinal juices. If, however, the p_H of the gastric juice is rendered neutral or slightly alkaline, absorption of alkaloids then occurs about as rapidly from the stomach as from the soft subcutaneous tissues. The high p_H of the saliva would favor prompt and rapid absorption of an alkaloid from the oral mucous membrane, whereas after swallowing the drug a delay in the appearance of effects would occur until it had reached the small intestine.

The influence of the p_H on the absorption of alkaloids from membranes and surfaces other than the gastrointestinal mucosa has been known a long time, but it might well be emphasized here. For example, alkalization of a solution of cocaine increases the rate of penetration of this anesthetic. Nicotine poisoning results from the application of a solution of nicotine base to the skin, but poisoning does not occur when the sulfate is similarly applied. Thus the acidity or alkalinity of a solution, which determines the amount of the free alkaloidal base present, is a factor of practical importance in the absorption of alkaloids. This probably applies to all routes of administration.

DR. CATTELL: Solution of posterior pituitary is a familiar example of a drug which is ineffective when given orally, owing to proteolytic digestion in the gastrointestinal tract, but which is readily absorbed by the nasal mucous membrane.

DR. GOLD: May I ask Dr. Eggleston a question in regard to rectal administration? It is said that rectal administration of digitalis is more effective than oral administration because when given by rectum the material escapes the destructive action of the liver. I have reference particularly to the study which Robert Levy made some years ago, in which he took issue with that notion.

DR. EGGLESTON: Yes, I think Dr. Levy's studies and the experiences of many of us have shown that if such destruction does occur, it is of no material importance. Certainly digitalis is absorbed by rectum with a very reasonable approach to the efficiency with which it is absorbed by mouth, and absorption does not vary materially. I would take issue with the suggestion that it is more effective when administered by rectum than when administered by mouth; the evidence points to the need for administering somewhat larger doses by rectum.

than by mouth to accomplish the same effect, so that I doubt if absorption is better by rectum than by mouth. There does not seem to be much evidence for destruction by liver when the dose is administered orally. It is probable that a part of that administered by rectum passes through the liver too, if not the major portion of it. We do not know, but Levy's experiments, which were designed to show the site of absorption, in which he utilized a radiocontrast substance, showed that administration by rectum of solutions of digitalis was followed by their rapid passage into the upper reaches of the rectum, from which absorption carries them through the liver rather than through the shunt that occurs from the extreme lower end of the rectum.

SUMMARY

DR. GOLD: I may now briefly summarize some of the chief points which issue from the discussion this morning. The oral route is the method of choice and parenteral administration should not be used without satisfactory proof of special needs. There is experimental indication that the distribution of a drug, and therefore the pattern of its action, is not necessarily the same by oral as by intravenous injection, and this might influence therapeutic results. Therefore, more than the matter of convenience and speed of action is involved in parenteral administration. The subject is in need of clinical study.

Most of the drugs used in the treatment of heart failure are generally given by oral administration: digitalis, the xanthines as diuretics, the nitrites, quinidine and the hypnotics. Intravenous digitalis medication is rarely necessary, and in that case ouabain is preferable. The digitalis preparations are too irritant for subcutaneous injection. The mercurial diuretics are best given by the intravenous route. Aminophylline has special advantages by intravenous injection in Cheyne-Stokes respiration. Acetyl-beta-methylcholine is best given by subcutaneous injection.

It is suggested that the danger of chloral hydrate as a sedative for cardiac patients is exaggerated. But, since it is quite irritant, it must be well diluted and its disagreeable taste masked for oral administration. Paraldehyde is regarded as a particularly safe sedative for cardiac patients.

The sex hormones (gonadotropic hormones, estrogens, progesterone, androgens) are at present employed mostly by parenteral routes, for reasons of efficacy and economy. The loss of potency is too great by the oral route. Only one is sufficiently pure for intravenous use, namely the one obtained from mare serum. The others are given subcutaneously or intramuscularly.

The special problems of administration of drugs to children were discussed. Liquid preparations and the parenteral route are particularly applicable to the sick infant who either can not or will not take medicines in other forms.

The recent studies on the role of the pH on the absorption of alkaloids were discussed. These drugs penetrate tissue barriers much more quickly when the medium is strongly alkaline than when it is acid.

Attention was called to the nasal mucosa as an absorbing medium for drugs which are not effective by the oral route.

The view that drugs absorbed from the rectum act differently from those given by mouth because the former escape the action of the liver is shown to be incorrect. The evidence is that most of the absorption takes place in the upper portion of the rectum which drains into the portal circulation.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE FIVE SEROBACTERINS NAMED IN THE APPENDED REPORT WERE OMITTED FROM THE 1939 EDITION OF NEW AND NONOFFICIAL REMEDIES IN ACCORDANCE WITH ACTION TAKEN BY THE COUNCIL IN 1938. FOLLOWING ITS CUSTOMARY PROCEDURE, THE COUNCIL TRANSMITTED TO SHARP & DOHME THE STATEMENT EXPLAINING THE OMISSION OF THE PREPARATIONS FROM NEW AND NONOFFICIAL REMEDIES. ON DEC. 28, 1938, THE FIRM ACKNOWLEDGED RECEIPT OF THE COUNCIL'S REPORT AND REQUESTED A FURTHER POSTPONEMENT OF COUNCIL ACTION FOR SIX MONTHS TO AWAIT THE OUTCOME OF CERTAIN EXPERIMENTS DESIGNED TO PROVIDE ADDITIONAL INFORMATION WITH WHICH TO EVALUATE THE SEROBACTERINS. THE FIRM ASSURED THE COUNCIL THAT DURING THIS PERIOD ALL FORMS OF PROMOTIONAL ADVERTISING ACTIVITIES WOULD BE DISCONTINUED. SUBSEQUENTLY, UNDER DATE OF OCT. 12, 1939, SHARP & DOHME REQUESTED A FURTHER EXTENSION OF THE PERIOD OF ABEYANCE "FOR ONE YEAR FROM THIS DATE" WITH THE UNDERSTANDING THAT NO PROMOTION OF THE SEROBACTERINS "EITHER IN MEDICAL JOURNAL ADVERTISING OR IN BROADSIDES TO PHYSICIANS" WOULD BE MADE.

SINCE THE SEROBACTERINS HAVE BEEN ACTIVELY MARKETING FOR MORE THAN A QUARTER OF A CENTURY, DURING WHICH TIME ADEQUATE EVIDENCE TO ESTABLISH THEIR THERAPEUTIC VALUE MIGHT WELL HAVE BEEN EXPECTED TO BECOME AVAILABLE, AND BECAUSE AN EXPLANATION OF THE COUNCIL'S DECISION OMITTING THE SEROBACTERINS FROM NEW AND NONOFFICIAL REMEDIES 1939 MAY BE OF INTEREST TO THE MEDICAL PROFESSION, THE COUNCIL AUTHORIZED PUBLICATION OF THE APPENDED REPORT WITHOUT PREJUDICE TO ANY FURTHER CONSIDERATION OF THE FINAL RESULTS OF THE SHARP & DOHME INVESTIGATION WHICH MAY BE DEEMED TO BE NECESSARY.

PAUL NICHOLAS LEECH, Secretary.

SEROBACTERINS-MULFORD (SHARP & DOHME) OMITTED FROM N. N. R.

In 1914 and 1915 the Council accepted certain of the "Sero-bacterins" which were manufactured by the H. K. Mulford Company, as follows: Acne Sero-bacterin-Mulford, Cholera Sero-bacterin-Mulford, Staphylo-Sero-bacterin-Mulford, Typho-Sero-bacterin-Mulford and Typho-Sero-bacterin Mixed-Mulford. The descriptions of these products in New and Nonofficial Remedies, 1938, are preceded by the following statement:

These products are prepared in the same manner as bacterial vaccines, except that the bacterial suspensions are treated with the serum of an animal which has been immunized to some extent against the species of organism in hand. The serum is then washed from the bacterial bodies by centrifugation and the latter are resuspended in physiological solution of sodium chloride.

It should be noted that the foregoing does not authorize any claims of superiority over nonsensitized vaccine for these sero-bacterins. In 1937 Sharp & Dohme presented a booklet, "Advantages of Sero-bacterins in Bacterial Vaccine Therapy," for the Council's consideration as advertising for its accepted products. Some unaccepted "Sero-bacterins" were mentioned in the text. In general the text gave the impression of having been written with a view to suggesting that "Sero-bacterins" are better than other well known prophylactic vaccines, that they have a wider field of application and that they offer "a degree of passive immunity during the period of lag or 'negative phase' which precedes the development of active immunity in the use of plain bacterial vaccines." The firm stated that there had been "recent improvements made in the preparation of sero-bacterins." The illustration in the booklet is typically of the "promotional" type, giving the impression that sero-bacterins should be used in preference to ordinary bacterial vaccines because the bacterial vaccines do not become effective for from eight to ten days, whereas in the case of the sero-bacterins the "negative phase" is removed. The Council requested the firm to show evidence that the sero-bacterins were superior to ordinary vaccines and especially to show what clinical evidence existed to establish this claim for recent improvements. The firm requested that the report be held in abeyance pending accumulation of additional evidence. The Council, following its usual custom acceded to the firm's request with the understanding, agreed to by the firm, that the products were not meanwhile to be actively promoted.

In September 1938 the firm presented data which it stated would aid in the further evaluation of the usefulness of its sero-bacterins. This was reported to the Council by the referee, who at the same time stated that after consultation with a number of associates who have had special experience in this field he was confirmed in his opinion that the evidence does not favor continued recognition of the preparations by the Council.

The Council therefore omitted from New and Nonofficial Remedies the Sero-bacterins-Mulford enumerated at the beginning of this report.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 13, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

PROTRUDED INTERVERTEBRAL DISK

The concept that a protruded intervertebral disk is the etiologic factor in cases of low back pain and sciatica was evolved as the result of accumulated facts and observations. The contributions of Luschka (1858) on the anatomy and physiology of this structure and the more recent studies of Schmorl, Andrae and their co-workers (1927-1932) on the pathology of the intervertebral disk as seen in their necropsy studies of more than 3,000 spinal columns provide scientific basis for the role assumed by this structure in a number of clinical conditions. The significance of the posterior propulsion of the disk in causing pressure on the contents of the neural canal grew out of the isolated but none the less important and convincing observations of Kocher, Middleton and Teacher, Goldthwaite, Adson, Dandy, Bucy, Stookey and others. Mixter and Barr established the clinical relationship between the protruded nucleus pulposus and certain cases of intractable

back pain and sciatica. A number of reports emanating from the Boston surgeons and from the neurologic service of the Mayo Clinic described in detail the clinical picture, the roentgenologic diagnosis with the aid of iodized poppyseed oil, and the results obtained from laminectomy and the removal of the protruded mass. The fascinating clinical story of the disk has been commented on editorially in *THE JOURNAL*.¹ More detailed information can be obtained from the monograph by Mauric,² from the review by Saunders and Inman³ and from the papers which recently appeared in *THE JOURNAL* (Dec. 2, 1939).

A new clinical concept which involves a not altogether innocuous diagnostic procedure and a major operation naturally evokes a skeptical attitude. Thus Symonds,⁴ in a discussion of Love's paper, stated that it was his impression that the prolapsed intervertebral disk is a rare cause of sciatica and that it is capable of spontaneous repair in most cases. The discrepancy between the figures of Andrae, who found this lesion in 15 per cent of his necropsy studies, and that of the Mayo Clinic for 1935, 1936 and 1937, which amounted to only 1.8 per cent of all the cases treated for low back pain and sciatica, lends support to his argument. Symonds inquires as to the proportion of cases of unilateral sciatica with protein content in the spinal fluid between 40 and 100 mg. in which the prolapsed disk can be demonstrated by the new iodized oil technic. The accuracy of the method, according to Camp,⁵ yields a percentage rate of 92.3 of accurate diagnoses, as verified in a series of 210 cases in which operation was performed. The literature on the subject does not contain a statement as to the relationship of the accuracy of the roentgenologic method to the protein content of the spinal fluid. Symonds inquires concerning the clinical grounds which should warrant the injection of 5 cc. of iodized oil into the thecal sac and the ill effects, if any, which may result from such an injection in a negative case. Others can hardly recognize more keenly the drawbacks of the method than the men who employ it. It must, however, be pointed out that much of the accuracy in the diagnosis of this condition has been developed on the basis of the roentgenologic method. In the hands of the men who employed this method most there were the least complications. Iodized poppyseed oil is an ideal contrast substance for the visualization of the spinal subarachnoid space, but it has definite disadvantages in that it is slowly absorbable, is more or less irritating to the meninges and is contraindicated in the presence of inflammatory conditions. It is recommended that the method be employed only when an intraspinal lesion is suspected. The refinement in clin-

1. Protruded Intervertebral Disk, Back Pain and Sciatica, editorial, *J. A. M. A.* **111**:1303 (Oct. 1) 1938.
2. Mauric, G.: *Le disque intervertébral*, Paris, Masson & Cie, 1937.
3. Saunders, J. B. deC. M., and Inman, V. T.: *The Intervertebral Disk: A Critical and Collective Review*, *Internat. Abstr. Surg.* **69**:14, in *Surg., Gynec. & Obst.*, July 1939.
4. Symonds, C. P.: *Proc. Roy. Soc. Med.* **32**:1712 (Oct.) 1939.
5. Camp, J. D.: *The Roentgenologic Diagnosis of Intraspinal Protrusion of Intervertebral Disks by Means of Radiopaque Oil*, *J. A. M. A.* **113**:2024 (Dec. 2) 1939.

ical diagnosis of the condition will result in further limiting its use. Thus Love⁶ operated in ten cases and Craig in twenty-seven in which the clinical diagnosis was made without the use of the contrast medium. Dandy in 1918 suggested air as a contrast medium in myelography. Chamberlain and Young⁷ employed air and oxygen in more than 300 spinograms and found the method accurate and reliable. Both air and oxygen are entirely harmless and are rapidly absorbed. Camp, however, states that its satisfactory use is restricted to the lumbar region and that the accuracy of the diagnosis is not equal to that attained with iodized oil. The ideal radiopaque agent has not thus far been found.

As was to be expected, most of the criticism has come from orthopedic surgeons, for they have seen innumerable painful backs and cases of sciatica improve with conservative treatment like warmth and rest, manipulation, traction, physical therapy, fasciotomy and what not. While others may not appreciate the intricacy of the functional mechanism of the lower part of the back and the variety of derangements arising from it as do the orthopedic surgeons, it is probably equally true that the structures enclosed within the bony framework of the spinal column are for them somewhat of an unexplored terrain. The most drastic criticism appeared in a recent issue of the *British Medical Journal* by Pappworth.⁸ He indicates that he is not convinced that a protruded disk is not "merely an incidental finding and not the cause of the symptoms." He poses the following questions: "Can retropulsion of the nucleus pulposus cause symptoms? If it can, is a laminectomy the only treatment? Are the results of laminectomy such as to justify operation?" The criticism is based on seven articles written by the Boston and the Mayo Clinic contributors. Attention is called particularly to statistical discrepancies in a paper by Barr. In view of the fact that a new clinical concept is a matter of accumulating and varying experiences, it is not quite clear why Pappworth did not review the entire literature on the subject. Had he done so he would not have run into the error of stating that "Love and Camp do not believe trauma to be an important etiological factor." Actually Love states "From a study of our cases the important conclusion emerges that a history of trauma frequently precedes the onset of symptoms."⁹ Pappworth points out that the most frequent age incidence was given as 40, "an age at which a normal disk is rare to find," and argues that such disk lesions as were found at operation could well be a coincidence rather than the cause of the symptoms. That, of course, is the opposite of the opinion enter-

tained by the authors, namely that the frequency of the degenerative changes in the disk is what facilitates the rupture of the annulus fibrosus and the consequent escape of the pulposus mass. With regard to the intermittence of the symptoms, it is freely admitted by Love, Mixter and other workers that there is no satisfactory explanation for it. It may depend on the regression of the edema so frequently found in the protruded fragment, on its temporary diminution in size or on the degeneration of the nerve trunk from pressure by the mass. The fact that not every symptom in a complex can be explained does not negate the complex. Pappworth quotes Barr to the effect that fusion operations were done in from 40 to 50 per cent of his cases. This raises a doubt in his mind as to whether "the time in bed and the absence from work or the fusion itself are not responsible for the relief of symptoms." The neurosurgeons at the Mayo Clinic did not perform the fusion operation and have obtained gratifying results.

Without going into further detail, it may be said that the same charge of inaccuracy which Pappworth levels against Barr and Love is equally applicable to his own statement. A skeptical attitude based on insufficient and inaccurate data recalls the ruralite who, on first seeing a dromedary, exclaimed "I don't believe it; there ain't no such animal."

EFFECTIVE STERILIZATION OF EATING UTENSILS

The extent to which disease germs are disseminated in public eating and drinking places, such as restaurants, lunch rooms and beverage "parlors," is a matter of public concern. Numerous organisms, such as hemolytic streptococci, pneumococci and diphtheria bacilli, have been discovered on tableware and hand-washed dishes. A recent report¹ confirms the value of chlorine as a sterilizing agent.

A bacteriologic survey was made in the town of Peterboro, Ont., of eighteen, mostly small, public places in which food or beverages were dispensed. All but three had double metal sinks. All used towels for drying purposes. Bacteriologic specimens were obtained by rubbing sterile swabs at least three times over the entire area of spoons, forks and tumblers that would come in contact with the user's mouth. These specimens were taken after the noon or evening "rush" period after the utensils had been washed and made ready for use. Samples of wash and rinse water were taken by means of sterile pipets and placed in sterile vials. The temperature of the wash water varied from 95 to 140 F., that of the rinse water from 48 to 150 F. On the assumption that a plate count of 100 is a reasonable maximum to be set for eating utensils, laboratory examinations showed that more than half of the restaurants were not properly sterilizing the utensils or satisfactorily cleaning them before sterilization. They

6. Love, J. G.: Protruded Intervertebral Disks with a Note Regarding Hypertrophy of Ligamenta Flava, *J. A. M. A.* **113**: 2029 (Dec. 2) 1939.

7. Chamberlain, W. E., and Young, B. R.: The Diagnosis of Intervertebral Disk Protrusion by Intraspinal Injection of Air: Air Myelography, *J. A. M. A.* **113**: 2022 (Dec. 2) 1939.

8. Pappworth, Sidney: Retropulsion of the Nucleus Pulposus, *Brit. M. J.* **2**: 1038 (Nov. 25) 1939.

9. Love, J. G.: Discussion on Prolapsed Intervertebral Disk, *Proc. Roy. Soc. Med.* **32**: 1699 (Oct.) 1939.

1. MacPherson, R. M.: Sterilizing Eating Utensils by Chlorine, *Canad. Pub. Health J.* **31**: 79 (Feb.) 1940.

disclosed the presence of colon bacilli, diphtheroids and streptococci in 90 per cent of the specimens. The total number of organisms ranged from ten to 35,000. The total number of bacteria in wash water was between 100 and 400,000, while that of the rinse water was from 100 to 47,000.

A follow-up survey was made several months later after a chlorine concentration of 100 parts per million had been proposed, double sinks installed where previously lacking, proper instructions given and periodic checks made to determine whether the chlorine used in the rinse water was of sufficient strength. The results were highly gratifying. After sterilization with chlorine solution the bacterial count per utensil was found, in all but one case, to be below 100 and in many instances organisms, such as colon bacilli, were not detected either on utensils or in specimens of the rinsing water. Only four specimens of wash water and one of rinse water exceeded 1,000 bacilli. Since the temperature range of the wash water and the rinse water was the same as in the preliminary survey, the whole credit for sterilization is given to chlorine, a simple and inexpensive sterilizing agent. The report emphasizes that two sinks are essential for prophylaxis, that drying by hand towels has no place in any system of dishwashing in public places, and that the mere dipping of unwashed glasses in a chlorine solution without previous cleaning is insufficient, though frequently done in beverage rooms.

Current Comment

ARMY MEDICAL LIBRARY BUILDING DELAYED

More delay in providing adequate quarters for the Army Medical Library now results from the action of the House Committee on Appropriations on President Roosevelt's budget recommendation that \$600,000 be made available for the purchase of a site and for the drafting of plans for the new building. The committee recommended that only \$130,000 be now made available and earmarked this sum for use in the preparation of plans. This recommendation was predicated partly in the view that the act of the Seventy-Fifth Congress authorizing the construction of the new building contemplated the use of government owned property and hence did not authorize an appropriation for the acquisition of a site. The committee pointed to the fact too that the act authorized the Secretary of War to construct the building and not the Public Buildings Administration as proposed in the budget. The Military Establishment Appropriation Bill, H. R. 9209, embodying the recommendation of the committee, has passed the House of Representatives and is pending in the Senate Committee on Appropriations. The Congress can hardly be accused of precipitant action in this matter but the House committee did record itself as believing that "there is unquestioned need for the early provision of appropriate housing for the Army's medical library, which is generally recognized to be the most valuable collection of medical literature in the world."

In view of this recognition of the urgency of the situation, the continued irresolution with respect to this project is difficult to understand. An invaluable, unique, irreplaceable collection of scientific material thus continues to be housed in a veritable fire trap, while immense funds are voted for purposes not nearly so pressing.

NEW HOSPITALS OR MORE SUPPORT FOR EXISTING HOSPITALS

At a recent hearing in Washington before a subcommittee of the Senate Committee on Education and Labor, Dr. Parran, Surgeon General of the United States Public Health Service, supporting the George-Wagner bill, introduced into the record the replies he had received in response to inquiries addressed to all state health officers asking what hospital facilities were needed in their respective states. From five states a reply was not received. From twenty states health officers answered that there was no need for additional general hospitals. Justifiable, therefore, is the conclusion that in more than half of the states, as far as general hospitals are concerned, there is no need for new construction. In the remaining states nine health officers indicated in a general way that more hospitals were needed, basing the statement in some cases on the fact that the ratio between hospital facilities and population fell short of some arbitrarily assumed standard or that a certain number of counties in the state were without a general hospital. In only fourteen of the forty-eight states did the health officers allege a specific and definitely localized need. These states were:

Rocky Mountain Region		Elsewhere	
	Percentage Occupancy of General Hospital Beds		Percentage Occupancy of General Hospital Beds
Colorado.....	63	Florida.....	79
Idaho.....	61	Kansas.....	63
Montana.....	62	Michigan.....	71
Nebraska.....	60	Mississippi.....	64
New Mexico.....	56	New York.....	79
Utah.....	61	West Virginia.....	58
Washington.....	68	Wisconsin.....	65
Average.....	62	Average.....	61

In a number of instances the statement of need was qualified by the comment that the community would be unable to support a hospital. In none of the states outside the Rocky Mountain region is there any appreciable area which does not already contain a general hospital. Probably, therefore, what the health officers of the other states desired to indicate was a lack of tax supported hospitals or of any provision by which public funds could be used to pay for the care of indigents in the private institutions now available. Altogether, the reports of these health officers seem to show that, apart from the sparsely settled desert or mountainous regions of the West, which, in any case, could not maintain satisfactory hospitals, and the lack in the South of adequate accommodations for Negroes, the really urgent need at the present time is not new hospital construction but more liberal provision of public funds to pay for hospitalization in existing institutions of those who are unable to provide for themselves.

ORGANIZATION SECTION

THE WAGNER-GEORGE-LEA BILL TO PROMOTE THE NATIONAL HEALTH AND WELFARE THROUGH APPROPRIATION OF FUNDS FOR THE CONSTRUCTION OF HOSPITALS

HEARINGS BEFORE THE SUBCOMMITTEE OF THE COMMITTEE ON EDUCATION AND LABOR, MARCH 18

PRESENT: SENATORS MURRAY, CHAIRMAN OF THE COMMITTEE; THOMAS OF UTAH, LAFOLLETTE OF WISCONSIN, ELLENDER OF LOUISIANA, TAFT OF OHIO, WAGNER OF NEW YORK AND GEORGE OF GEORGIA

(Concluded from page 1377)

Dr. John P. Peters, Secretary of the Committee of Physicians for the Improvement of Medical Care

DR. PETERS: These hospitals, we hope, will be regarded as initial experiments in community medical care which will aid in the discovery of formulas for the establishment on a wider scale of exemplary coordinated health services. Care should be taken that hospital plans be not accepted which will compromise the future development of a larger program. It is the earnest hope of our committee that this project shall not be undertaken as a substitute for a more comprehensive health program but as a step toward such a program. Desirable as it may be for communities to take the initiative in solving their own problems, the greatest need for community hospitals is likely to be found in localities that are too unorganized to take concerted action without some stimulus from above and too poor to assume the whole burden of support of even a modest hospital from their own resources.

Section 4, establishing a National Advisory Council of experts, is in our opinion of the utmost importance. In our statement it was suggested that this council be appointed by the President rather than by the Surgeon General, although authority should reside in the latter. The question may be raised whether the most valuable quality of an advisory council, its disinterested judicial attitude, may not at times be jeopardized if the appointment of the council is entrusted to the administrator whose actions are to be guided and sometimes subjected to criticism by this council.

It must be realized in advance that physicians of the quality desired for these hospitals cannot be attracted to the neediest communities by the mere presence of a hospital; they must have the assurance of at least a decent living. It must be certain that the bill is so drafted that support of these hospitals may include—I should prefer must include—assurance of payment for professional services. We are also of the opinion that payment by salary for the time devoted to hospital work is preferable to payment of fees for individual acts because it favors the coordination of services for the best interests of the organization as a whole.

William F. Montavon, Director, National Catholic Welfare Conference

MR. MONTAVON: The Catholic Hospital Association, the National Conference of Catholic Charities and the National Catholic Welfare Conference, for whom I speak, welcome any sound practical method for making hospital care and health services available to those needy localities to which the President refers in his message of January 30. We agree with the President and this committee that any adequate solution of this problem calls for financial cooperation between national and local governments and requires the full, wholehearted and free cooperation of the local community as well. The purpose stated in the title of this bill fails to take into account the clear distinction between the problem we now face and the more complex problem of national health security. But to link these local situations up with a national health security program, with the standardization that a national program demands, we believe would complicate and tend to defeat the purpose of this bill. I suggest that in this bill we omit all reference to national

health and state the true purpose of the bill in simple language, as "A bill to provide for the general welfare by an appropriation of federal funds for the construction of needed hospitals" and that we change the provision in section 1 of the act to read "This act may be cited as the Hospital Construction Act of 1940."

We believe that in the maintenance and operation of these hospitals the service to the community served by the hospital will be greatest if the bill is amended to provide a higher degree of autonomy to the community in the administration of the hospital than seems to be contemplated in the bill now before you. The President contemplates not a hospital operated directly by a local government. He does recommend that projects be submitted by responsible public authorities, but he also relies on public spirited citizens with means and on pay patients to supply income required for guaranteeing adequate satisfactory hospital services to the whole community, including all who "literally can afford to contribute little or nothing toward their treatment." A hospital looking to such sources for its income should be governed by a board of citizens and not by the government.

We submit the following amendments: [Copy was submitted.]

The amendments recommended a Federal Advisory Hospital Council (hereinafter referred to as the "council") to consist of seven members to be appointed by the President of the United States with power to select their own chairman. Each member of the council shall be a competent authority outstanding in matters pertaining to medical care, hospitals and other health and welfare services. The statement also proposed: "No new hospital facility shall be approved under this section of this act to be erected in any community which at present has a hospital facility owned and operated by government or by a nongovernmental association or voluntary corporation of private citizens organized and operated not for profit, or where adequate hospital service can practically be made available by providing free ambulance service to such a hospital in a neighboring community."

It was suggested that training of personnel be omitted, as this was a hospital construction program and not a hospital administration program and we believe that the problems of personnel are problems of hospital administration and should not be controlled federally.

The statement pointed out that in the bill the lease is terminated and no provision is made whatever for what shall happen to that hospital after that. Who is going to operate it, if at all? Is it going to remain there an empty building or for sale or what not? We suggest that we add ". . . and the Surgeon General on recommendation of the council and in cooperation with local agencies shall take such steps as will permit the temporary continuance of the services of the hospital needed by the community pending fulfillment by the lessee of the requirements of this act."

The speaker also presented a letter written by Alphonse M. Schwitalla, S.J., who is the president of the Catholic Hospital Association. He stated that "the Catholic Hospital Association is in agreement with the purposes of this bill, recognizing that there are some areas in which a hospital is needed. In view of the representations made to the hospital and the medical associations at the conference with the President, it seems somewhat

disquieting that an appropriation is contemplated in S. 3230 not only for the year ending June 30, 1941, but for each fiscal year thereafter" as in section 2 "and 'The President is authorized to allocate from funds appropriated pursuant to this act' sums not only for the fiscal year ending June 30, 1941, but also for each succeeding fiscal year," as authorized in section 9. He thought that the Advisory Hospital Council might be appointed by the President himself; that it would enjoy a measure of autonomy, at least in the selection of its own chairman and secretary; that it would meet with the Surgeon General, the latter, however, not being a member of the council itself; and, finally, that the council would be free to conduct its own investigations when it desired to do so, so that the experimental character of the project might be completely and fully safeguarded.

He wished to see some restriction on studies to be made by the Surgeon General and on training of personnel. Also the officers of the Catholic Hospital Association would prefer to see a clarification of the functions of the Surgeon General and of the advisory council with reference to the various local groups who are interested in a hospital project.

Dr. Fred G. Carter, President of the American Hospital Association

DR. CARTER: We agree in principle with the purposes of the program outlined in the National Hospital Act of 1940, which have to do with the provision of needed hospital facilities to serve rural communities and economically depressed areas. We know that there are certain sections of the country which are not now adequately served by hospitals and we are glad to support legislation looking toward the alleviation of this condition.

We come to this hearing mindful of the fact that we have had definite assurances that the program was to be an experiment covering a period of one year, or at most financed by a single appropriation, and we are disturbed by finding that the bill provides for its indefinite continuation. We firmly believe that before permanent legislation is enacted the results of the experiment should be carefully evaluated. Many conditions not now apparent will be encountered in the trial period. It will be found, for instance, that the mere building of a hospital is a relatively simple problem when compared with the task of integrating that hospital into its community. If the experiment proves the need for, and wisdom of, further effort, thought may then be given to ways and means of carrying on.

It can be taken as a major premise that a community which has the financial resources to support a hospital will be resourceful enough to secure one under present conditions. Support of the hospital after it is constructed is even more important than the construction. This bill asks for assurances of support from all communities requesting hospitals. Those most in need will be unable to give such assurances. Surely some provision should be made for partial subsidy during the period in which communities are adjusting themselves to their new responsibilities. Philanthropic foundations have found that their work of hospital construction in rural areas had to be followed up by partial operating subsidies for periods of three years or more.

We note with satisfaction that the act contemplates hospital construction only in such communities as can demonstrate the need for such facilities. We sincerely hope that there will be no duplication of reasonably adequate existing facilities, private or public, in any community.

Among hospital people the utmost respect exists for the Public Health Service but under the provisions of this act it is embarking on a venture which is somewhat strange to its field of activity. The National Advisory Hospital Council therefore should be the strongest obtainable if grave errors are to be avoided. Men who have had actual hospital administrative experience certainly should constitute a part of this council. It is fair to say that the success or failure of the experiment will depend to a great extent on the personnel of the council and the responsibilities delegated to its members.

Dr. Kendall Emerson, Managing Director, National Tuberculosis Association

DR. EMERSON: The National Tuberculosis Association appreciates this opportunity to record its approval of the National Hospital Act of 1940 (S. 3230, H. R. 8240). The act falls far short of making adequate provisions for all the needs of the country. The principles on which its provisions are based, how-

ever, are sound and susceptible of extension ultimately to fill these needs. It is to be noted with special approval that the act does not limit the services of the general hospitals for which it provides to any single type of illness or disease.

Recently an official inquiry was made among health commissioners of the several states to determine for what particular disease beds were most needed in their jurisdictions. More than half the replies indicated an outstanding lack of beds for the hospitalization of tuberculous cases. In 1900 the number of beds for the tuberculous in this country approximated 6,000. In 1939 this number had grown to 90,000 beds. During the same period the death rate from tuberculosis in the United States dropped from 200 per hundred thousand of the population to less than 50. Isolation of the patients is our main reliance in the control of tuberculosis, since we have no specific preventive or curative measure for the disease. The National Tuberculosis Association suggests the desirability of allocating a definite proportion of the funds authorized under the National Hospital Act of 1940 specifically for the provision of beds for the tuberculous. The association desires to express its endorsement of the act. However, it recognizes the act as only one step toward the provision of adequate general hospitalization which the needs of the country demand.

SENATOR TAFT: Do I understand that the American Hospital Association would be in favor of a complete federal system of hospitals?

DR. EMERSON: This is the National Tuberculosis Association.

SENATOR TAFT: That the National Tuberculosis Association would be in favor of a complete federal system of hospitals? Are you now expressing approval of the federal government building hospitals throughout the United States?

DR. EMERSON: I am now commenting solely on the bill as presented.

SENATOR TAFT: The principle of the bill is construction of hospitals by the federal government owned by the federal government—owned by the federal system.

DR. EMERSON: In areas where such hospitals are needed.

SENATOR TAFT: A federal system of hospitals your association approves then?

DR. EMERSON: In areas not otherwise provided for as the bills provide.

SENATOR WAGNER: I think that is an important limitation.

DR. EMERSON: It is, sir. That is as far as we have gone in approval, but that is the way we interpret the bill.

SENATOR TAFT: The principle of the bill is the establishment of a federal hospital system in areas where there is need but where states are perfectly able to provide it if they wish to do so.

DR. EMERSON: The bill states that areas where they are needed and the hospitalization does not already exist or is not comparable.

SENATOR TAFT: Why shouldn't the states do it under the constitution? This is a function of the states, not the federal government.

DR. EMERSON: Well, I should say that that would have to be answered by the presentation of another bill to compete with the present bill. We have the feeling that the federal assistance in such matters is, at the present time, desirable.

SENATOR TAFT: Federal assistance, yes. That is not my question. The principle of this bill is federal construction and federal hospital system and that is what I understand your association fully approves.

DR. EMERSON: We would also put in the reservation decidedly that Mr. Montavon brought up: that it is clearly understood by us that the appropriation of a limited amount for a limited number of hospitals is proposed by the President on an experimental basis. We would certainly put that in as a proviso in our endorsement of the bill, so I think in answering your question I could say "no." We did not approve it *carte blanche* for a general federal hospital program. We heartily approve the experimental factors as stated.

SENATOR MURRAY: Are not tuberculosis hospitals on a somewhat different basis from general hospitals, these tuberculosis hospitals for the control of a disease that is nationwide and is not confined to state boundaries? Isn't it a program that the federal government would naturally be interested in?

DR. EMERSON: I should heartily agree with you in that statement.

SENATOR TAFT: Do you know in what states the state has the responsibility for tuberculosis hospitals and in which it is handled by local governments?

DR. EMERSON: I am afraid I can't answer that statistically. There are a good many states that have their own state hospitals and there are a good many that have county hospitals. They are still governmental but not always state institutions. Many states have the dual system.

SENATOR TAFT: Are there many private, not for profit, tuberculosis hospitals? Or are they usually governmental?

DR. EMERSON: There are approximately 7,000 beds for the tuberculosis owned by private hospitals which would be in the profit-making group. That is, they are privately owned institutions and supposed to be self supporting. Approximately 7,000 beds, and nearly 90,000 are publicly owned.

SENATOR TAFT: It has been a governmental function much more than general hospitals, hasn't it? In proportion, I mean.

DR. EMERSON: In the past forty years the ratio has changed completely from a large number of privately owned beds to an overwhelming number of publicly owned beds; somewhere in the neighborhood of very nearly 90,000 publicly owned. In the documents accompanying this report, these needs are specifically recorded. The association has already given its endorsement to Senate Bill 2547, a bill "to impose additional duties upon the United States Public Health Service in connection with the investigation, treatment and control of tuberculosis." This bill recognizes the full gravity of tuberculosis as a preventable, epidemic disease and provides federal aid on an adequate scale to enable an aggressive program for the rapid and complete eradication of the disease.

Arthur M. Calvin, Chairman Legislative Committee of the American Protestant Hospital Association

MR. CALVIN: The American Protestant Hospital Association represents the major portion of the protestant church hospitals of America. It has been their desire at all times to cooperate with all health organizations and government bodies in promoting better health to the people of our country. If there is a need for the construction of small hospitals, as proposed in the bill, you should not overlook the fact that all who champion the cause of church hospitals must continue to insist that these voluntary institutions and agencies which have been set up, and whose functions have been carried on for many decades by heroic efforts of self-sacrificing individuals and organizations, must not be interfered with. Their further expansion and future development must not be impeded and the American people must not be deprived of the ultimate benefits that flow from them.

SENATOR TAFT: Do you see any reason why the bill shouldn't provide for a joint association with a private group like a church group—

MR. CALVIN (interposing): Not at all, sir.

SENATOR TAFT (continuing)—for the construction of a hospital? I mean supposing a church group came in to the Surgeon General and said that they had a certain endowment fund and they had a certain amount of money that could be devoted to the maintenance of a hospital if the federal government would build a hospital for them, or they might even be able to contribute 10 or 20 per cent of the cost—

MR. CALVIN (interposing): No objection whatever.

SENATOR TAFT (continuing)—do you see any reason why the federal government shouldn't extend federal aid to that kind of institution?

MR. CALVIN: No, sir.

SENATOR TAFT: As well as to build a general hospital?

MR. CALVIN: Yes, sir. We are in accord that in some areas and groups they are best served by governmental agencies. However, it is apparent from all indications that the uncertainties of the untried field of general governmental hospitalization are not an adequate substitute for the splendid present and past contributions of the volunteer church hospitals and their activities. The intention of this act, as is our general understanding, is not to destroy the voluntary initiative of church organizations or individuals and establish a vast system of governmentally controlled and operated general hospitals but to enter the

field of hospitalization in poor rural areas and for the permanently unemployable where hospitals are to be supplemented, not superseded. Therefore it appears that this program should not be extended for more than one year, at which time the experience of such may be reviewed. As in education, so in health, private initiative should be encouraged where citizens are able to provide for their own health and well-being. And in our democracy we concur with this committee that government action should only be a last resort. We further submit the following recommendations which we desire written into the bill:

1. That the National Advisory Hospital Council should be composed of a fair proportion of hospital administrators.

2. That the National Advisory Hospital Council should take under consideration for approval of application for hospitals that such institutions shall maintain the standards which the American College of Surgeons, the American Medical Association and the hospital associations regard as minimal for rendering such service.

Agreeing as we do to the purpose of the bill, we are mindful of the importance of the selection of the members of the advisory council who will be given the responsibility of carrying out the intent of the bill. We desire that such advisory council be as receptive in accepting counsel from this association from time to time as has been the consideration shown us by the committee and other government officials.

SENATOR WAGNER: Are you a doctor?

MR. CALVIN: No, I am a layman.

SENATOR WAGNER: The bill provides, as we discussed a moment ago, the National Hospital Council, that six appointed members should be selected from leading medical or scientific authorities who are outstanding in matters pertaining to hospitals and other public services. Do you recommend that there be additional safeguard or don't you think this does—

MR. CALVIN (interposing): It doesn't specifically—

SENATOR WAGNER (continuing)—carry out the thoughts that you expressed?

MR. CALVIN: Senator, I don't think it specifically states that at least a portion of them should be hospital administrators, which we think would be most advisable.

SENATOR WAGNER: Oh, I see.

MR. CALVIN: Yes, sir.

SENATOR WAGNER: You think that ought to be a provision right in the act?

MR. CALVIN: Yes, I do, Senator.

SENATOR WAGNER: At least how many?

MR. CALVIN: Two at least.

SENATOR WAGNER: Thank you.

TUESDAY, MARCH 19

Dr. Reginald M. Atwater, Representing the American Public Health Association of New York

DR. ATWATER: We appear in support of this bill, S. 3230, because we believe it to represent a sound and a desirable next step toward the achievement of better health for all people. A concept of the close interrelationship between preventive and curative medicine we believe is basic to the public health program. We wish to be recorded as opposed to any plan which regards treatment and cure as belonging in water-tight compartments. The American Public Health Association has endorsed in general the plans for federal aid to the states for the construction of additional hospital facilities and hospital care as needed. We believe that it is essential that any program, to be worthy of federal aid, should include adequate provisions for the maintenance of high personnel standards, and we believe that the benefit from federal aid to such local agencies should be withheld when it is found that substandard services are being furnished. We regard as especially important the provision for the training and instruction of personnel and the emphasis which is laid in the act on provisions for the most disadvantaged areas.

We believe it, Mr. Chairman, unnecessary and indeed unwise to provide in this bill for what particular use shall be made of these hospitals, because it is not possible to formulate such a statement which will apply equally well in all parts of the country, or to anticipate fully all the possible contingencies.

The association approves a liberal definition of the term "hospital" as contained in the act because there is a variety of structures, like dispensaries or health centers, laboratories and x-ray units which will best serve some of the rural communities and the economically depressed areas.

Beyond the reasons for supporting the bill which seem to us logical and important we believe that the provisions for hospitals should not depend merely on cold statistical factors, about which so much of this testimony has revolved. There are other and important reasons why good hospital care is not a luxury but a necessity. We maintain that the count of hospital beds represents only a part of the value of such an institution in the community. A good hospital, even though built and maintained on simple lines, means better medical care. The adequate housing for a local health department, which this bill can provide, may mean as much to a locality through laboratory, x-ray and health clinic services as the beds themselves may mean. Let's take the health department out of the basement of the county courthouse, where it usually is, and relate it to the other medical and sanitary services where it belongs, and let us show the world that we know how to build for health security as intelligently as any nation on earth.

Dr. C. D. Bowdoin Representing the Georgia Department of Public Health

DR. BOWDOIN: The first exhibit is two charts which show a comparison of the 1938 death rates per hundred thousand of population in Georgia and the United States for typhoid, diphtheria, dysentery, malaria, pellagra, syphilis, puerperal or maternal, diarrhea and enteritis under 2 years of age, tuberculosis, cancer, pneumonia, infant mortality, cerebral hemorrhage and nephritis. The death rate from all of these diseases is higher than that prevailing in the United States except cancer. I might add that the death rate from heart disease is also slightly higher than that prevailing in the United States at large. Our interpretation of the low cancer death rate is that a sufficient number of our people do not live to the age when cancer is most common.

The second exhibit is a map reproduced from THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, March 11, 1939, showing available general hospital beds per thousand of population by states in the United States. Georgia is in the lowest group and is classed with Mississippi, Kentucky and Arkansas as having less than two beds for 1,000 population.

The third exhibit is a map of Georgia which classifies the counties into population groups of less than 5,000, from 5,000 to 10,000, from 10,000 to 20,000, from 20,000 to 50,000 and 50,000 and above. There are no general hospitals in the seven counties having a population less than 5,000, only three general hospitals in the forty-one counties having a population of from 5,000 to 10,000, only thirteen general hospitals in the sixty-five counties having a population of from 10,000 to 20,000, and twenty-eight general hospitals in the thirty-nine counties having a population of from 20,000 to 50,000. All seven counties above 50,000 population have general hospital beds. There are eighty-four registered general hospitals located in fifty-one of the 159 counties in Georgia.

The fourth exhibit classifies the counties of Georgia according to bed population ratios into five groups: Twenty-three counties have a per bed population ratio of 1 to 500 or less, twenty counties have a per bed population ratio of 1 to 500-1,000, seven counties have a per bed population of 1 to 1,000-3,000, one county a per bed population ratio of 1 to 3,000-4,000, 108 counties in Georgia have no general beds in registered hospitals, and the fifth and final exhibit is a population density map by militia districts.

Each tiny black dot represents twenty-five rural inhabitants; the large black dots represent towns and cities in proportion to their relative size; the red circle represents an estimated need of seven beds per thousand of population. The clear portion of the circle represents that percentage of seven beds per thousand of population now available. The red portion of the circle represents the percentage of beds needed to bring the number to seven beds per thousand in those counties having registered hospitals. The remaining counties have no general beds in registered hospitals. On the basis of seven beds per thousand of population Georgia now needs 17,159 additional

beds. If we use the accepted 4.5 beds per thousand of population, which in my opinion is low, Georgia now needs 9,351 general beds in addition to the existing 4,702 beds now available.

The 1939 general assembly of Georgia amended section 92-3701 of the code of Georgia of 1933 by adding an additional purpose for which county taxes may be levied and providing authority to the counties to levy a tax to provide medical or other care and hospitalization for the indigent sick people of the respective counties. This tax is not to exceed 1 mill.

To my mind this plan has more advantages than any other so far developed. In keeping with the trend of the times it would offer Georgia experimental opportunities of value not only to the state but to the nation, to develop a sane plan for the medical care of the underprivileged. Under this plan medical centers could be developed, providing not only hospital care but diagnostic services, outpatient clinics, laboratory and x-ray services, tuberculosis, venereal disease, immunization, mental hygiene, orthopedic, well baby and maternal clinics. The medical center should establish a sound working relationship between the public health worker, the welfare worker, the private physician and the public at large. The multiplicity of benefits, soon so apparent to all, should soften such opposition as may develop to the cost of the service, which would be relatively small in comparison to the value received in the removal from exposure of well persons to illness, the prevention of incapacitation or prolonged sickness, and in lives directly saved.

SENATOR MURRAY: How many counties do you say there are that have no hospitals at all?

DR. BOWDOIN: One hundred and eight counties with no hospitals.

SENATOR MURRAY: How many counties do you have in Georgia?

DR. BOWDOIN: One hundred and fifty-nine. Georgia is the largest state east of the Mississippi River.

SENATOR MURRAY: Montana is a very large state and we have only fifty-six counties. Don't you think you have too many counties in Georgia?

DR. BOWDOIN: You are exactly right, Mr. Chairman, and I think maybe this plan will help us to consolidate some of them.

Dr. W. S. Rankin, Director the Duke Endowment, Charlotte, N. C.

DR. RANKIN: I am not appearing either as an opponent or as an advocate of the bill. We have had about fifteen years' experience in dealing with small hospitals or with all the general hospitals, I might say, of North and South Carolina: If there is any information that we have accumulated that might be helpful to the committee, I would be glad to give it to you.

SENATOR MURRAY: Have you any statistics already prepared that you could leave with us?

DR. RANKIN: The best thing I could leave with you, Mr. Chairman, I presume would be our annual report. It is very brief and boiled down. It might be helpful. It gives you costs of construction, costs of operation, and so forth.

SENATOR MURRAY: We will be very glad to have it.

Dr. Carl G. Roberts, Representing the National Medical Association

[Dr. Roberts described the National Medical Association and the American Medical Association, pointing out that today they are cooperating amicably on a common basis of understanding as to the manner in which the national health problems should be met.]

The life expectancy of the Negro is anywhere from eight to ten years shorter, his death rate in some instances from 50 to 100 per cent higher. There is an inexcusable high incidence of disease among Negroes. Some of the reasons for these conditions are inequity, inadequacy and low economic status, inequity of distribution of medical care and hospitals, inadequacy of those facilities in those areas in which they are distributed.

[He pointed out the shortage of hospital beds and of facilities for medical training for Negroes.]

For a Negro population of approximately 230,000 in Chicago, one twelfth of the population has access to only one fortieth of the beds, and that includes the large charity institutions. Less than 3 per cent of the hospitals in Chicago, including the one colored hospital, and all the charity institutions, accepted Negro patients. Of that 3 per cent, 2.5 per cent were either charity beds or the Negro was used for teaching purposes. As this is illustrative of the problem as it exists in several of the Northern centers, and the need in these urban centers is just as great as it is in some of the rural ones, because out in the rural districts they at least have access to light and air, which is not true to such a great extent in the cities, we would recommend that the purposes of this bill be broadened to include aid to existing facilities in the large urban centers in instances in which great urgency of need is shown. The plight of the Negro doctor is even more difficult than that of the Negro patient. There are some facilities in some sections of the country, aside from his own hospitals, into which the Negro patient is admitted, but oftentimes the Negro doctor who is treating that patient, figuratively must stop at the door because his privileges stop there and he is not admitted.

Again referring to the fact that these problems are not sectional; for instance, in Boston there is practically no opportunity for a Negro surgeon to operate on his own patients. The same thing is now true in Los Angeles, true to a larger extent than it is in many of the larger Southern cities. As the future and welfare of the Negro health problem is, in the last analysis, bound up with the opportunity that is afforded to his own physicians to care for his health, we feel that no great success can be attained until these opportunities are expanded and enlarged.

The National Medical Association respectfully recommends the following amendments to the Bill S. 3230 (H. R. 8240):

1. Page 2, line 14: Insert after the word "population" "without discrimination on account of sex, race, color or religion."

2. Page 2, line 14: The term "all groups of the population" as used in this act shall include professional as well as lay people provided that they shall qualify under the required standards of competence.

3. Page 4, line 23 (C). Following the word "hospital" add "without discrimination on account of sex, race, creed, color or religion."

The National Medical Association recommends further:

That the act should be broadened in such manner as the committee may deem fitting and proper to include subsidies or aids to existing hospital facilities where urgent needs are shown and satisfactory prospects exist for rendering unusual service in control of disease.

With incorporation and adoption of the foregoing recommendations, the National Medical Association approves Bill S. 3230 (H. R. 8240).

Ernest R. Carney, President National Hospital Association

[Mr. Carney, who is administrator of the Parkside Hospital (for Negroes) in Detroit and president of the National Hospital Association of the United States, an association of Negro hospitals, described the organization.]

There are approximately 110 Negro hospitals located in various parts of the United States. During the past two years I have visited ninety-seven of these institutions. They extend from Detroit on the North to New Orleans on the South, and from Newark, N. J., on the East and as far as Phoenix, Ariz., on the West. A large proportion of these hospitals are owned or under the supervision of Negroes. More than 50 per cent are privately owned by doctors because they are denied the privilege of treating their patients in white hospitals. These hospitals have a bed capacity varying from seven beds in a rural community to 685 beds in one metropolitan city in the Midwest. They give employment to more than 2,000 Negro nurses and other personnel. Approximately half the Negro doctors use their facilities for diagnostic and therapeutic purposes. Twenty per cent of these institutions have

met the minimum requirements for approval by the American College of Surgeons and are approved by the American Medical Association for intern training.

During the past five years about 6,000 beds have been made available for Negro patients in various parts of our country through grants and loans by the Public Works Administration. Sixty per cent of these beds are used for the insane, 25 per cent in general hospitals and 15 per cent for tuberculosis.

As has been pointed out by previous witnesses, an analysis of beds by location in general hospitals shows that there is a great need and a marked tendency for more and more beds that must be made available for Negro patients in smaller towns and rural sections, especially in the South. If more beds are added by building new hospitals with wings and separate quarters for Negroes the patient will be benefited, but the Negro doctors, nurses and other personnel will not be benefited. We suggest, however, that representatives in Congress amend the bill, page 2, section 3, line 12, to read as follows: "Such hospitals will be made available under appropriate conditions to all persons without discrimination on account of sex, race, creed, color or religion," and page 4, section 6, line 22, and following to read "to provide training and instruction of personnel who will be required in connection with the hospital without discrimination among such personnel on account of sex, race, creed, color or religion."

The bill calls for assurances of support from the communities requesting the hospitals. Negro communities most in need of hospitals cannot give definite assurances. Obviously some provision must be made for whole or partial subsidy for their maintenance. Before final legislation is enacted we hope that there will be no duplication or elimination of any reasonably adequate private hospitals now in existence.

Charles H. Houston, Representing the National Association for the Advancement of Colored People

MR. HOUSTON: I will say nothing about need except to point out the fact that in a recent message the President himself made special reference to the need of Negro patients in the Southern states and your own committee, in making its preliminary report on Senate Bill 1620, page 34, section 4, part 7, on the question of protection of minority population groups, said "The committee believes that there should be just and equitable allocation of funds according to the need for services (referring to minority groups) and will study carefully the amendments suggested to carry out such purposes." We support the bill with the amendments which I shall suggest.

The question has been raised about the ability of the economically depressed areas to sustain and maintain the hospitals after they are once furnished by the federal government. The mere fact that you cannot cover all of the localities which need this particular service is no reason that the federal government should not take this initiatory step of covering those which can be reached within the terms of the limitations of the bill. We regard the bill itself as a sort of a demonstration to the nation of what adequate public health service can be through the cooperation of the federal government and the local authorities, the federal government furnishing the facilities and the local authorities furnishing the administration and the cost of upkeep and maintenance. Although the \$10,000,000 perhaps would not even cover the entire needs of hospitals, perhaps say in the state of Georgia, according to the testimony which has just been given, and certainly not in Georgia and the other areas of the South, to say nothing of the other sections of the country, there is no reason why this beginning should not be made. As between the proposition of maintaining the abstraction of states' rights and letting people suffer from inadequate health coverage and service, it seems to us that on the application of the local authorities themselves to the federal government you have all the protection which any person interested in maintenance of direct local control over public health could ask for.

[Mr. Houston followed the same general lines as the two preceding speakers but asked that a Negro be included on the council.]

On the question of training of personnel, we should ask that there be an amendment by way of addition to provide that

training and instruction of personnel will be required in connection with the hospital without discrimination among such personnel on account of sex, race, creed, color or religion.

Paul B. Cornely, Associate Professor of Public Health, Howard University, Washington, D. C.

[Dr. Cornely spoke for a joint committee of several organizations.]

The general death rate of the Negro is from one and one half to two times that of the white population. The average expectation of life of a Negro baby born today is from ten to twelve years shorter than that of a white infant. The death rate from tuberculosis among Negroes is from two to three times that of white persons. In the District of Columbia, for instance, the disparity is five to one, while in Baltimore and Detroit the same condition holds true. Dr. Parran has consistently stated that approximately six times as many Negroes suffer from syphilis as do white persons. The death rate from pneumonia, heart disease, childbirth and diseases of infancy show these same inequalities. There is no doubt that these proportions are due to a large extent to the lack of adequate and sufficient amounts of medical and hospital facilities. In the state of Texas there are approximately 28,000 beds for 4,000,000 white persons as compared to less than 200 for approximately 900,000 Negroes. In the Southern rural area approximately 80 per cent of the births are taken care of by midwives and only 0.6 per cent of the babies born in the rural areas to Negroes are born in hospitals. In a city which I visited in the South, in the Negro ward two and three Negro patients were sleeping in the same bed in this hospital, and that was in 1935.

Dr. Dorothy Boulding Ferebee, Washington, D. C.

[Dorothy Boulding Ferebee, a Negro woman physician, a graduate of Tufts Medical School, stated that her national priority approves the principles of this bill, subject to the amendments.]

On the basis of the experience of a national organization which has conducted a rural health project in Bolivar County, Miss., for the past five years during the summer months, and where we invested approximately \$13,000 in an effort to alleviate some of the health conditions among the Negro sharecropper families of the district, we have been able to see, on the basis of this experiment, a general improvement in the health of these people. Generally speaking, the Negro physician is not permitted in the public hospitals in the South. No physician can grow to his best competence without the opportunity to improve his skill and technic through the facilities of the scientific equipment of a hospital.

AFTERNOON SESSION

Charles Butler, Chairman Committee on Federal Public Works of the American Institute of Architects

MR. BUTLER: The American Institute of Architects commends the President for recommending the establishment of such hospital facilities, and the Congress for its intention to provide them, and offers all the aid it can give to bring about its desirable objective. We have two suggestions to make for possible amendments to the bill. The planning of hospitals is something which requires expert knowledge, men who have been trained in the field of hospital planning. The average architect doesn't know that. The medical profession knows pretty well what it wants but doesn't always know how to get it. We find that the medical men are apt to concentrate on their own particular specialties and not see the problem as a whole. The problem is particularly difficult in connection with these low cost hospitals which it is proposed to build. The hospital expert has got to know when to compromise, when to cut out certain things which can be cut out without harm to the patient, things that we should all like to have. Other things, of course, must be of the very best. That is what the hospital architect has been trained to do. He has to coordinate the requirements for efficient care of the patient with other factors such as inexpensive materials in many parts of the building and the need of forced ventilation in some rooms and not in others; he must simplify in every manner possible to permit ease and direct transportation of patients, distribution of food and supplies, and the reduction to the minimum of the work of the necessarily

very limited staff, both nursing staff, orderlies and so on. A hospital architect also is trained in selection of sites for a hospital, that part of the work, and the choice of locations where the wind is favorable, where the sunlight and air are favorable, and one of his jobs is to get the orientation for the wards of the hospital and at the same time get the north light for his operating room. We therefore urge that the bill be amended to provide that there be appointed by the Surgeon General a committee of architects qualified by experience in hospital planning, similar to the National Advisory Medical Council already provided for in the bill. The second suggestion that we have to offer is that the bill be further amended to provide for the employment of local architects and engineers to prepare plans and specifications, and supervise construction of these hospitals.

SENATOR MURRAY: You mean to suggest that such a provision should be inserted in the bill?

MR. BUTLER: Yes.

SENATOR MURRAY: Couldn't that be done by the Advisory Committee, consulting with them?

MR. BUTLER: At present the bill reads that it practically automatically would go to the Federal Works Agency, that work would be concentrated in Washington, and that is what we think might, with economy, be changed.

We have been making a study of costs in New York State which is not yet complete, but throughout the state we get the general impression that it costs from 6 to 25 per cent more to have the work carried out by the state, as it is in New York State entirely, rather than by private architects and engineers. The work would, of course, be under the general control of the Federal Works Agency, which is exactly in the position of the client. The government, of course, not being a person, cannot be a client. It is officially the client, but its representative on earth is the Federal Works Agency, and it would be exactly in the position or role of the intelligent, informed client who knows what he wants and directs those men who are trying to get it for him. We believe that the saving in building costs would well exceed any extra expense there might be in the employment of local architects. We believe further that the giving out of this work to local architects and engineers in the smaller communities would be a tremendous help to the members of two sorely tried professions. The engineers and the architects have had just about the hardest sledding in the last ten years of any profession in the country. I think that is generally admitted. And these jobs, which may not look like enormous jobs in the large cities, 100 bed hospitals, costing \$200,000 apiece, are a great big job to men in the smaller cities. There are men perfectly competent to do them, both architects and engineers. They may not get the mechanical engineers there, but the architects and the engineers are competent. It might also tend to dispel the idea that the government is trying to centralize the work in the Washington bureaus. After all, we have to admit that the progress of the architects of the United States in the last fifty years, which has put us just about ahead of the profession, has been done by engineers and architects in private practice.

John M. Carmody, Administrator of the Federal Works Agency

MR. CARMODY: I have discussed the plans with Mr. Reynolds of the Public Buildings Administration, and with Colonel Harrington. Mr. Reynolds, unfortunately, is out of the city but Mr. Louis Simon, who is the supervising architect and acting commissioner while Mr. Reynolds is away, is here. He has figures on costs, and Colonel Harrington also has figures on costs. They worked with Dr. Parran on the simple design of hospitals that I take it are to be built in areas where people are poor and where resources are not very great. In discussing it we have had in mind simplicity, we have had in mind the utility rather than expensive and expansive building.

SENATOR MURRAY: You have heard the testimony of the witness who just preceded you?

MR. CARMODY: I heard just part of what Mr. Butler has said. Mr. Butler and I have discussed that, not in connection with this particular program but in connection with the program in general. I think we are all aware of the fact that many architects in many parts of the country haven't had as much work as they would like to have. Similarly, engineers

haven't had as much work as they would liked to have had. As a matter of fact, a very considerable part of the work they have gotten in the past seven or eight years has come, either directly or indirectly, out of the public works program financed by the federal government. They have shared, I think, quite well in the work that has been built in the past seven years.

SENATOR MURRAY: It is my understanding that in all of the public works program local architects have been utilized in preparing the plans?

MR. CARMODY: Yes.

SENATOR MURRAY: But it has been suggested by the witness just leaving the stand that we should have an advisory board of architects, a provision for an advisory board of architects here in this bill, because, as he expressed it, they are more familiar with the scientific construction of hospitals and are more in touch with what should be the needs of the community and the location of the site and all that. What have you to say with reference to that?

MR. CARMODY: Well, I think that all of the intelligence that can be massed ought to be applied to the development of a program or to the construction of buildings erected for special purposes. I have a feeling that the more people you get into the program, the less progress you will make and the more expensive the buildings will be, and the more likely they will be to represent the ideas of a great number of people. For instance, I am not prepared to say specifically how much skill there is in the Public Health Service with respect to the design of a hospital. I dare say that if they haven't learned how to build a hospital by this time they ought to get some advice.

SENATOR MURRAY: I have a letter here from Mr. William Green, president of the American Federation of Labor, and I will have it inserted in the record at this point, because I think it raises some question with reference to the construction of these hospitals:

AMERICAN FEDERATION OF LABOR
Washington, D. C.

March 18, 1940.

The Honorable James E. Murray
Chairman, Committee on Education and Labor
The United States Senate,
Washington, D. C.

Dear Sir:

For the purpose of increasing available hospital facilities and creating new employment at present, the American Federation of Labor endorses the bill (S. 3230) to provide for the appropriation of \$10,000,000 for the provision of needed hospital facilities for rural communities and economically distressed areas. We believe that the adoption of this bill would be a step in the direction of providing more adequately for the health needs of low income families. It would create some of the facilities needed for carrying out the broader program which we believe essential to a well rounded program of social insurance.

We do not regard this bill as a proper substitute for a more adequate program, but we favor it as an initial step. We urge, however, that the bill be amended to include a provision that all workmen, laborers and mechanics employed in the construction of any hospital financed under it shall be paid not less than the wages prevailing for the corresponding classes of workmen, laborers and mechanics employed on similar work in that locality. This provision is needed to safeguard the interest of workmen by preventing the use of federal funds to depress prevailing wage scales.

Very truly yours,

President, American Federation of Labor.

WILLIAM GREEN.

SENATOR MURRAY: As I understand, under the Works Progress Administration at the present time there is no provision for prevailing wage scales; that is true, is it not?

MR. CARMODY: That is true; the wage scale was really set by the Congress at what it is now.

SENATOR MURRAY: So that if we proceeded to carry out the construction work under the Works Progress Administration it would have to be done under the present system that the Works Progress Administration is operating under?

MR. CARMODY: Well, I am told that the language of the bill would permit changing the WPA scale to the prevailing wage scale for the specific purpose of building these hospitals. I doubt if that is a practical thing to do because one of these hospitals might be under construction in an area where the WPA has a construction project, of perhaps a different nature, but close enough so that some of the same kinds of skilled labor are working on both of them. I think to have two wage standards

on a group of WPA projects would be a mistake. I don't think it is practical. If WPA labor may not be used on these hospitals, I think some of the purposes of the bill may be interfered with, namely, that they are in areas where there are not considerable numbers of skilled men, and it is possible in those areas to give work to people who need it badly, who are competent to do a good deal of this work, perhaps not all of it, because there are certain skills that require long experience and training for those skills; whoever builds the hospitals would have to go to the normal sources for those skills.

SENATOR MURRAY: It is contemplated that most of this construction work will be away from the larger communities and principally in the rural sections.

MR. CARMODY: That is my understanding.

MR. CARMODY: I hope that the bill will make reference to the fact that the construction work will be carried on under the general supervision of the Federal Works Agency. That gives flexibility to the program; it gives us a chance to work through PWA or WPA or the Public Buildings Administration. For instance, the Public Buildings Administration will certainly make some of the plans, maybe not all of them, but even if the private architects make some of the plans there will be a certain amount of supervision over that planning on the part of the Public Works Administration, which is already familiar with this program and similar programs. So if the construction work is kept within the Federal Works Agency it gives all of us a chance to work together in a much more flexible way than if it should be assigned to a specific unit in the Federal Works Agency.

Louis Simon, Supervising Architect Federal Works Agency

MR. SIMON: The question of the costs of these hospitals is one that requires a little explanation in that there are a number of intangible elements which enter into the cost of a building before you know where it is going. There are things like the question of the difference in the labor market and the material market in different parts of the country; the question of whether it is in a rural community where all the outside utilities like the sewers and water and electricity, and everything, cost more than they would under other circumstances, if you had to dig wells, and so forth, for the water. It is a question of the climate, where the heating apparatus would be more expensive in a very severe climate than it would be in a mild climate. Then the topography and the soil that you are building on. If it is full of rocks, that is one thing for the foundation; if it is a very easy soil to dig, it is very much less expensive. So with that explanation I thought that perhaps we might put into the record, if agreeable to the Chairman, a statement that you could enter into the record that would put it before you in as comprehensive a way as possible.

SENATOR MURRAY: We would be glad to have it.

MR. SIMON: In the meantime, I may say in going into this thing we worked on the basis of hospitals of three different capacities, fifty beds, eighty beds and 100 beds. Now, as you probably know, as you increase the number of beds the cost per bed decreases because there are certain features of a hospital, such as the operating room, that will take care of eighty people as well as fifty patients. And there are certain other things that are the same up to a certain point. The size of a kitchen for fifty patients would not differ greatly from the size of a kitchen for eighty patients. And there are a number of things like that. So that the cost per bed reduces as you increase the number of beds. We have figured with the work done by the WPA, the labor being furnished by the WPA and the material being furnished by purchase, for a fifty bed hospital is \$71,000 for material only, exclusive of equipment; say \$80,000 including the equipment. For an eighty bed hospital it is \$81,000 for material, exclusive of equipment, and we add about \$350 a bed for equipment of a hospital of that size, which brings that up to \$109,000. For a 100 bed hospital it is the same for the building material but \$30,000 for the equipment, which brings it up to \$111,000. Now that doesn't sound very logical that the construction of

the building itself for an eighty bed hospital is the same as the construction of the building for a 100 bed hospital. But in this case it is a fact for this reason: In the eighty bed hospital there were furnished extra quarters for the local health officers, which, as I understand it, the Public Health Service thinks might be a good thing but perhaps not absolutely necessary. In the 100 bed hospital they took exactly the same size building, put the health officers outside and let them find their own quarters, and added twenty more beds.

SENATOR MURRAY: There has been some question raised during the hearings regarding the advisability of having the health department in the hospital building.

MR. SIMON: Yes, sir. We also thought the committee might want to have the cost as related to material only, plus WPA labor, translated into the cost that would probably be required in it was done by a contract, which is the more usual way and which expresses the cost per bed in a way that it is usually expressed. So I would also include that in my statement, if it is agreeable to the Chairman.

SENATOR MURRAY: That is perfectly agreeable. If this work was done by contract it would be very greatly in excess of the cost if done by relief labor under the Works Progress Administration, would it not?

MR. SIMON: It would cost a little more, but I don't think greatly in excess, sir, depending on conditions and the labor market in the particular place. I think it gives you the general picture except to say that those costs, on a basis of contract, figure up roughly to \$4,000 a bed for a fifty bed hospital and \$3,100 for an eighty bed hospital, and about the same for a 100 bed hospital. Now those prices can just be carried up or down, depending on what kind of a building you want. Some hospitals have been built where there are costs of \$5,000, \$6,000, \$7,000 and more. Some of the big New York hospitals have costs of \$10,000 a bed, but this isn't that kind of arrangement.

SENATOR MURRAY: If these hospitals were all built on a standardized plan, they could be built much more cheaply than if each one were built as an independent unit?

MR. SIMON: It enables the same amount of study to work them down to a standard practice, which certainly does result in a reduced cost.

Col. Francis C. Harrington, Commissioner of Work Projects of the Federal Works Agency

COLONEL HARRINGTON: The President's message of January 30 contemplated or suggested the use of WPA labor in the construction of these hospital units, and I should like to make the general statement that the WPA can undertake the execution of this program or such part of it as may be desired. We have constructed buildings of this size in practically all parts of the United States. They have been schools, armories, court-houses and buildings of that nature; and assuming the continuance of WPA, certainly through the next fiscal year, on approximately the same basis as at present, the WPA could carry out this program. In connection with Mr. Simon's testimony, which just preceded mine, he referred to the cost of building these hospitals by contract. It was not made quite clear that if they were built by contract the entire cost of each unit would have to come out of the special appropriation which your committee is considering; whereas, if built by WPA labor, approximately 50 to 60 per cent of the cost would come out of the appropriation and 40 to 50 per cent of the cost would be put in as WPA labor from the WPA appropriation. In other words, the use of WPA labor in connection with this project would merely double the amount of construction that could be provided with any size of special appropriation. We estimate roughly that the division of funds between WPA and these specially appropriated funds would be about half and half, exclusive of certain special equipment such as operating room equipment and things of that kind.

The procedure under which the WPA would operate projects would be that a project would be sponsored by the Public Health Service and the plans would be provided by the Public

Buildings Administration, and the WPA would become the constructing agency.

The question was brought up of certain specialized types of labor that might not be available in rural communities, and from an operating standpoint I would say that, where those types of labor were not available, as a general matter you would contract those items of work. For example, if you had an elevator to install and you did not have the mechanics in the community who were familiar with that work, you would in all probability buy the elevator installed under a contract and let the successful bidder do that job. And the same thing is true of certain other specialized things that would go into the building.

But in the consideration of the design of these hospital units the question of the availability of highly skilled labor has been taken into consideration, and the type of building that is being studied is a type that can be built with the labor that is usually available; that is, consideration is being given to monolithic concrete construction, which does not require bricklayers or tile setters. And I should like again to make the general statement that the WPA can carry out this program if it is desired.

In that connection there are two provisions in the current WPA act for which exemption should be provided in the act authorizing this appropriation. The first one is a provision that the WPA cannot construct any building as a federal project at a total cost of more than \$50,000. That is section 12 of the emergency relief appropriation act of 1939. And an exemption to that provision or requirement would have to be inserted in the act making this appropriation. The second provision of the current WPA act is section 1(c), which provides that in any state we cannot expend more than \$6 per man per month for purposes other than labor; that is, for the purchase of materials or the rental of equipment; and an exemption to that requirement should also be inserted in any act making this appropriation. I should be very glad, if the committee desires, to submit a draft of the language that is necessary in that connection, which will be very simple.

SENATOR MURRAY: We will be very glad to have that. If an exemption is provided on that point, what would be the extent to which the exemption would go?

COLONEL HARRINGTON: On the \$6 item?

SENATOR MURRAY: Yes.

COLONEL HARRINGTON: Tentatively, in discussions with the Public Buildings Administration, we have contemplated that we might go to \$12 a man per month in nonlabor expenditures.

SENATOR MURRAY: Have you any other statement to make in this connection?

COLONEL HARRINGTON: No, Mr. Chairman.

SENATOR THOMAS: Colonel, we have now had WPA for several years. What is happening to the persons who are working under the WPA arrangement; are they learning how to work? In changing from job to job is there any development in their craft or skill?

COLONEL HARRINGTON: A good many of them have learned skills on WPA projects, and the personnel of WPA is continuously changing. We have at work today about 2,300,000 people on WPA, but since WPA was established on July 1, 1935, we estimate that about 8,000,000 different people have been employed, 8,000,000 different individuals. Furthermore, during the present fiscal year in the months of July and August we were required by law to remove from WPA all persons who had been employed for eighteen months, and in accordance with that provision we did remove about 775,000 people from the WPA rolls, some of whom have since come back but who could come back only after a period of at least thirty days, and after reinvestigation of their need for employment.

SENATOR THOMAS: Do you think that it is preparing them for other employment, contributing to their other employment, developing the individual man?

COLONEL HARRINGTON: Very definitely I think so. It is either teaching them to do things or it is conserving their

capacity to do things at what they know how to do, and preventing them from deteriorating from idleness.

SENATOR MURRAY: You have had no difficulties in connection with your program of buildings in the various sections of the country; you have been very successful, have you not, in the character of construction that has been done on court-houses and schools, and so forth?

COLONEL HARRINGTON: Yes, Senator, we have done buildings of almost every character, running from the hangars at LaGuardia Airport in New York City, which cost over \$1,000,000 apiece, down to \$5,000 buildings of various kinds in the rural communities. We have done practically every type of construction. We probably never had as favorable a project as this presented, the favorable things being that these buildings can be designed with a standard of uniformity which will be very helpful in building them and of a type of construction which is suited particularly to the labor that we generally have available.

SENATOR MURRAY: Well, the work that you have already done would indicate that you would have the capacity for handling a job of this kind.

COLONEL HARRINGTON: Very definitely, I think so; yes, sir.

MR. CARMODY (resuming): Out of considerable experience in the construction industry, and out of a very intimate experience in the building of rural electrification lines, I hope that the bill will be kept simple and flexible and workable. Under the Rural Electrification Act, which is a simple act, we were allowed to do the work in the way that would give the greatest economy and the greatest satisfaction to the people that were paying for it, namely the farmers. We did some of it by contract, we did some of it by force account. On our force account work we got unit costs that enabled us in our subsequent contracts with the contractors to get very much better prices for better work, and for work that was performed more rapidly. So whatever we do in this bill, let's keep it simple

and let's not put too many barriers in the way of getting low costs without at the same time tearing down standards of workmanship and standards of wages, and when I say "standards" I mean WPA standards, because those standards for a certain kind of work and for certain classes of people have been set by the Congress itself.

[At the direction of Senator Murray, the following document was incorporated in the record:]

CONGRESS OF INDUSTRIAL ORGANIZATIONS
1106 Connecticut Avenue N.W.,
Washington, D. C.

Office of
General Counsel
Honorable James E. Murray,
Senate Office Building
Washington, D. C.

March 16, 1940.

Dear Senator Murray:

On behalf of the Congress of Industrial Organizations we desire to express our support for S. 3230, providing for an appropriation of \$10,000,000 to be used for the construction of hospitals throughout the country by the federal government and thereafter to be owned by the federal government, although operated by state agencies. We believe this bill should contain a guaranty that in the administration of these hospitals there will be no discrimination against patients on account of race, color, creed or any other reason.

In expressing our approval of this bill we wish to make it clear that we feel that the relief granted by S. 3230 is totally inadequate to meet the need for hospital services. This need has been amply demonstrated by the studies conducted by the President's Interdepartmental Committee to Coordinate Health and Welfare Activities. S. 3230 makes no effort to deal with the basic problem of providing adequate medical care for those of our citizens who are unable to afford any medical care whatsoever, or the cost of medical care as it now prevails.

We therefore respectfully urge this committee to report out favorably at this time S. 1620, the National Health Bill, on which hearings have been held and a preliminary report issued by your subcommittee. S. 1620 marks the beginning in the establishment of a sound health program and has received the complete endorsement of the C. I. O. at its two conventions.

LEE PRESSMAN, General Counsel.

[Statements were presented also by the National Association of Colored Graduate Nurses, Inc., and by the American Optometric Association.]

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1461 has been reported to the Senate proposing that retired enlisted men of the Army, Navy, Marine Corps and Coast Guard when hospitalized or domiciled in either an Army or Navy hospital or United States Naval or United States Soldiers' Home shall be extended treatment or domiciliary care without cost. H. R. 9209 has passed the House, making appropriations for the Military Establishment for the fiscal year ending June 30, 1941. This bill includes an appropriation of \$130,000 for the preparation of plans for a new building to house the Army Medical Library and Museum.

Bills Introduced.—H. R. 9202, introduced by Representative Gross, Pennsylvania, proposes to authorize the President, in the name of Congress, to present a medal of honor to Dr. George E. Holtzapfel, "who administered oxygen in the treatment of pneumonia for the first time on record March 6, 1885." H. R. 9215, introduced by Representative Green, Florida, proposes to direct the Administrator of Veterans' Affairs to furnish to any child under 21 years of age of a veteran of the World War who contracts any disease from such veteran the same domiciliary care and medical and hospital treatment as would be furnished such veteran suffering from such disease. H. R. 9221, introduced by Representative McCormack, Massachusetts, proposes to establish in the Department of Labor a Bureau for the Welfare of the Deaf. This bureau would be authorized (a) to collect, tabulate and make public statistics pertaining to the deaf, their employment, and their welfare; (b) to ascertain what fields of employment are available to the deaf, and to endeavor to create new fields of employment; (c) to acquaint employers in private industry with the special capabilities of the deaf and to encourage the employment of the deaf on an equal basis with the hearing; (d) to cooperate

with the heads of the various departments of the government, with the Civil Service Commission and states and political subdivisions in expanding the opportunity for the employment of the deaf in public service, and (e) to cooperate with any public or private agency in the vocational rehabilitation of the deaf. The bill is pending in the House Committee on Labor.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 3720, introduced by Senator Bilbo, Mississippi, proposes to establish a Board of Funeral Directors and Embalmers for the District of Columbia and to prescribe its powers and duties.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—S. 166 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic. The bill proposes to define chiropractic as "the science, art and philosophy of things natural; a system of adjusting the vertebral column and of the tissues adjacent thereto by hand for the removal of nerve interference thereby to eliminate the cause of disease." A licentiate is to have the right to examine patients and to diagnose any disease, pain, injury, deformity or physical condition and to prescribe or regulate the dietary, sanitary and hygienic habits of the patient. S. 177, to amend the medical practice act, proposes to permit the board of medical examiners to examine an applicant who submits satisfactory evidence that he has pursued and completed a course of study in a foreign country that would entitle him to licensure in that country except for the fact that the laws of that country require licentiates to be citizens thereof.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

State Medical Meeting at Tucson.—The meeting of the Arizona State Medical Association will be held at Tucson, April 17-20, with headquarters at the Santa Rita Hotel and under the presidency of Dr. Charles S. Smith, Nogales. Included on the program are:

- Dr. William S. Middleton, Madison, Wis., Masquerades of Bronchiogenic Carcinoma.
- Dr. Hans Lissner, San Francisco, Some Clinical Experiences with Newer Sex Hormones.
- Dr. Maurice L. Tainter, San Francisco, The Clinical Value of the New Benzadrine and Ephedrine-like Drugs.
- Dr. John Shelton Horsley, Richmond, Va., Cancer of the Stomach and Small Intestine.
- Dr. Charles F. McKhann, Boston, Progress in the Control of Communicable Disease.
- Dr. Edward L. Dorsett, St. Louis, Toxemias of Pregnancy.
- Dr. Samuel D. Ingham, Los Angeles, Relationship of Neurology to Other Departments of Medical Practice.
- Dr. Thomas J. Harris, New York, Treatment of Acute and Chronic Sinusitis.

Dr. Charles A. Dukes, Oakland, Calif., president of the California Medical Association, will give a public address Thursday evening on "Voluntary Budgeting for Medical and Hospital Needs and the Dangers of Compulsory Insurance Politically Controlled." All the out of state speakers will conduct round table luncheons. Arizona physicians on the program are:

- Dr. John E. Bacon, Miami, Forty Years of Industrial Surgery.
Dr. Henry G. Williams, Phoenix, A Practical Procedure in the Treatment of Fistulas of the Small Intestine.
Dr. Thomas H. Bate, Phoenix, Bronchial Obstruction.
Dr. E. Payne Palmer, Phoenix, Acute Abdominal Emergencies.

A series of extension lectures on pediatrics, gynecology and obstetrics will be conducted immediately following the annual meeting of the state medical association. The lectures will be under the auspices of the maternal and child health division of the state department of health in cooperation with the association's committee on maternal and child health. Dr. McKhann and Dr. Dorsett will be the speakers.

CALIFORNIA

Society News.—Dr. Meyer Wiener, St. Louis, discussed "Problems in Surgical and Medical Ophthalmology of Interest to the Medical Practitioner" before the Hollywood Academy of Medicine, March 14.—Dr. Hale F. Shirley, San Francisco, discussed child guidance problems at a dinner of the San Mateo County Medical Society, San Mateo, March 27.—The urologic section of the Los Angeles County Medical Association and the Clinical and Pathological Society, Los Angeles, were addressed at a joint meeting, March 28, by Dr. William F. Braasch, Rochester, Minn., on "Hypertension and the Surgical Kidney."

New Physicians' Aid Association.—The Los Angeles County Physicians' Aid Association has been organized to provide aid to worthy needy members of the profession. The new aid association is not an insurance company and is not the responsibility of the Los Angeles County Medical Association but aims merely to supplement assistance from other sources and to provide necessities not already covered. On the board of directors are Drs. Elizabeth M. Hohl, Olga McNeile, Alfred R. Robbins, Victor J. Sprauer, Philip J. Cunnane, Herbert O. Barnes and Arthur Elmer Belt. The new organization has been achieved by the committee on relief and fraternal relations of the county medical association, which has in the past been caring for eighty-one members and their dependents.

COLORADO

Dr. Hagerman Named Warden at New Institution.—Dr. Robert P. Hagerman, chief medical officer at the U. S. Penitentiary, Atlanta, Ga., has been appointed warden of a new federal correctional institution at Denver. The institution, with an ultimate capacity of 600, will receive younger, more tractable types of offenders originating in the mountain states area; it will also receive persons receiving short terms and those awaiting trial. Located on the outskirts of Denver, it was constructed at a cost of \$1,500,000. It will be ready for occupancy July 1. It was one of a series of six institutions authorized for construction with PWA funds.

Dr. Hagerman will take up his new work in the latter part of May. He has been a member of the U. S. Public Health Service since January 1932, when he was assigned as chief medical officer at the federal correctional institution at Fort Eustis, Va. In February 1932 he was transferred to the federal reformatory at Chillicothe, Ohio, to assume charge of the public health service activities. In July 1939 he was transferred to the Atlanta penitentiary. He graduated at the University of Maryland School of Medicine in 1923. After completing his internship he was assigned to duty at the U. S. Marine Hospital, Baltimore, where he was in charge of the urologic service until 1927.

DISTRICT OF COLUMBIA

Society News.—The Washington Ophthalmological Society was addressed, March 25, by Drs. Cecil S. O'Brien, Iowa City, on "Carcinoma of Eyelids"; Georgiana Theobald, Oak Park, Ill., "Origin of Choroidal Tumors," and Avery D. Prangen, Rochester, Minn., "Some Salient Factors in the Surgical Treatment of Extra-Ocular Muscles."—Dr. Russell L. Cecil, New York, addressed the George Washington University Medical Society, March 16, on the arthritic problem.—Dr. Adolf Meyer, Baltimore, discussed "Essentials in the Psychoneurosis Problem" before a meeting of the naval medical and dental officers on duty in the District and vicinity, March 4.

Annual Meeting of Hospital Society.—The third annual meeting of the Medical Society of St. Elizabeths Hospital, Washington, will be held April 20. The speakers will include:

- Drs. Armando Ferraro and George A. Jervis, New York, Alzheimer's Disease (The Adult Form).
 Dr. Bernard Gluck, Ossining-on-Hudson, N. Y., Metrazol Shock Therapy.
 Dr. Lawrence Kolb, Washington, The Personality of Drug Addicts.
 Dr. Arthur P. Noyes, Norristown, Pa., Personality and Psychoses.
 Dr. Winfred Overholser, superintendent, St. Elizabeths Hospital, Past, Present and Future.

At the annual dinner in the evening at the Mayflower Hotel, the Hon. A. A. Berle Jr., assistant secretary of state, will speak.

ILLINOIS

Personal.—Dr. Mary R. McConahy, oldest alumna of the University of Michigan Medical School, Ann Arbor, recently observed her one hundredth birthday at the Presbyterian Home, Evanston. She graduated in 1890.

Society News.—Dr. Joseph C. Jaudon, St. Louis, discussed the care of the newborn before the Adams County Medical Society, Quincy, February 12.—Dr. Milton C. Winternitz, New Haven, Conn., conducted a clinic and discussed "Problems of Vascular Pathology" before the Peoria City Medical Society, March 5. Dr. Clifford U. Collins addressed the society, March 19, on medicolegal problems.—Dr. Meyer Brown, Chicago, addressed the Madison County Medical Society, Granite City, March 1, on "Headache, Including Migraine."

Postgraduate Conference.—The Illinois State Medical Society will sponsor a postgraduate conference in the assembly hall of the Dixon State Hospital, Dixon, April 18. The following program has been arranged:

- Dr. Julius H. Hess, Chicago, Bronchiectasis in Childhood.
Dr. Charles M. McKenna, Chicago, Some Problems in the Diagnosis of Renal Tumors.
Dr. Francis E. Seneear, Chicago, Diseases of the Skin.
Dr. Delmas K. Kitchen, Detroit, Diagnosis and Therapy of Sexual Immaturity.
Dr. Warren G. Murray, Dixon, Interesting Cases Shown by Staff Members of the Dixon State Hospital.
Dr. Carl V. Moore, St. Louis, Differential Diagnosis and Treatment of the Hemorrhagic States.
Dr. Charles B. Puestow, Chicago, Influence of Drugs on Intestinal Motility.
Dr. Harold D. Palmer, Rockford, Clinical Pathology of the Kidney.
Dr. Charles F. Sawyer, Chicago, Biliary Tract Disease.
Dr. Robert S. Berghoff, Chicago, Thyroid Heart Disease and The Diseased Gallbladder and Its Relation to Heart Disease.

Chicago

Chicago
University News.—Dr. Burrill B. Crohn, New York, lectured at the University of Illinois College of Medicine, March 2, under the auspices of Alpha Omega Alpha, on "Peptic Ulcer."

Session on Infant and Maternal Mortality.—The Chicago Medical Society will devote its meeting on April 17 to a discussion of "Infant Mortality in Chicago 1935-1939" by Dr. William I. Fishbein. Drs. Luella E. Nadelhoffer and Julius Hess will discuss "Maternal Mortality in Chicago 1935-1939." A clinical meeting will be held at the Chicago Lying-In Hospital in the morning and afternoon while the evening session will be at the Chicago Woman's Club.

Special Lectures.—J. Christian Bay, librarian of the John Crerar Library, will give an address in the assembly room of the Institute of Medicine of Chicago, 86 East Randolph Street, at 8 o'clock, April 16, under the auspices of the Society of Medical History of Chicago. He will discuss "Men, Method, and Memory in Scientific Progress." Dr. M. Ruiz Castañeda, department of medical research, General Hospital, Mexico City, will give an illustrated lecture at a joint meeting of the Institute of Medicine of Chicago, the Chicago Society of Internal Medicine and the Chicago Pathological Society, April 29, at the Palmer House, on "Recent Advances in Research on Typhus in Mexico." The second Ernest Edward Irons Lecture was delivered at Billings Hospital, March 26, by Dr. David P. Barr, Busch professor of medicine, Washington University School of Medicine, St. Louis, on "The Nature of Obesity." Dr. Edward W. Archibald, emeritus professor of surgery, McGill University Faculty of Medicine, Montreal, Que., will deliver the sixteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation before the Institute of Medicine of Chicago, April 26. His lecture will be entitled "Discussion of the Theories Concerning the Causation of Acute Pancreatitis."

MASSACHUSETTS

Lecture on Medical Ethics.—The George W. Gay Lecture on Medical Ethics was delivered at Harvard Medical School, Boston, March 19, by Mr. Philipps Ketchum, Boston, on "How Does a Doctor Spend His Money?"

Alumni News.—Plans to observe the twenty-fifth anniversary of the class of 1915 of Harvard Medical School were initiated at a recent meeting in Boston. Dr. Fabyan Packard is chairman of the committee on arrangements.

MICHIGAN

Dinner in Honor of Dr. Shurly.—A testimonial dinner will be held in the Masonic Temple, Detroit, April 25, in honor of Dr. Burt R. Shurly. On this occasion Dr. Shurly will be presented with the gold medal awarded him by the American Academy of Ophthalmology and Otolaryngology at its 1939 annual session for noteworthy contributions to the knowledge of nose and throat disorders. Dr. Ralph H. Pino, president of the Wayne County Medical Society, will make the presentation address. Many local agencies are sponsoring the dinner. Dr. Shurly graduated at the Detroit College of Medicine and Surgery in 1895. In 1913 he bought the school to save it from probable dissolution and later gave it to the city. He was dean of the school until he left for France with the American Expeditionary Forces in 1918. Dr. Shurly has served as president of the American Laryngological Association, the American Laryngological, Rhinological and Otolological Society, the American Academy of Ophthalmology and Otolaryngology and the Detroit Academy of Medicine. He was secretary of the Section on Laryngology, Otolaryngology and Rhinology of the American Medical Association from 1911 to 1913 and chairman, 1913-1914. He has served as a member of the House of Delegates of the Association since 1922.

MINNESOTA

State Medical Meeting at Rochester.—The eighty-seventh annual session of the Minnesota State Medical Association will be held at the Mayo Civic Auditorium, April 22-24, under the presidency of Dr. Bertram S. Adams, Hibbing. Headquarters will be the Kahler Hotel. Dr. Nathan B. Van Etten, New York, President, American Medical Association, will address an evening session of the house of delegates Sunday evening on "An American Health Program." Out of state speakers will include:

Dr. Paul B. Magnuson, Chicago, Fracture of the Neck of the Femur.
Dr. Florian E. Schmidt, Chicago, Treatment of Scarlet Fever.
Dr. Harry E. Mock, Chicago, Skull Fractures and Cerebral Injuries.
Dr. Anthony J. Lanza, New York, Pneumococci.
Dr. John O. Bower, Philadelphia, Clinical and Surgical Aspects of Spreading Peritonitis Complicating Acute Perforative Appendicitis.
Dr. Fred L. Adair, Chicago, Prevention and Treatment of Genital Prolapse.
Dr. Norman H. Jolliffe, New York, Clinical Aspects of Vitamin B Deficiencies.
Dr. Paul L. Schroeder, Chicago, Emotional Factors in Organic Disease.

Dr. Bernard H. Nichols, Cleveland, will deliver the Russell D. Carman Memorial Lecture, sponsored by the Minnesota Radiological Society, on "Indications for the Use of Excretory Urography in Diagnosis." Dr. Russell L. Cecil, New York, will deliver the Mayo Foundation Lecture on "Present Trends in

the Study of Arthritis and Rheumatism." A symposium on fractures will be presented by Drs. Mark H. Tibbetts, Duluth, Manford O. Oppegaard, Crookston, and Otto W. Yoerg, Minneapolis. At the annual banquet the Southern Minnesota Medical Association will award its medal to the physician presenting the best scientific exhibit, and the speakers will include the Hon. Harold E. Stassen, governor of Minnesota, and Mr. Bernard H. Ridder, publisher of the St. Paul *Dispatch* and *Pioneer Press*, whose subject will be "How the Peace of the World Was Lost."

MISSOURI

New Health Units.—Full time health units were recently established in Jasper and Pemiscot counties, bringing to a total of eight the number of counties with units subsidized in part by funds from the state board of health. Webb City is headquarters for the Jasper County unit and Caruthersville for Pemiscot County.

Portrait of Dr. Ravenel.—Former students of Dr. Mazzyk P. Ravenel, professor emeritus of medical bacteriology and preventive medicine, University of Missouri School of Medicine, Columbia, are presenting an oil portrait of him to the university, newspapers reported. The painting was done in Kansas City by Albert Adams Sloan and will be presented formally later in the year. Dr. Ravenel was active at the medical school from 1914 to 1936.

Academy of Science Meets with Medical Profession.—The medical section of the Missouri Academy of Science will meet jointly with the Sixth Councilor District of the Missouri State Medical Association at the Central Missouri State Teachers College, Warrensburg, April 18-19. The speakers will include:

Dr. Edwin H. Schorer, Kansas City, Rationale of Public Health Development.
Dr. Claude R. Bruner, Columbia, Sinusitis.
Dr. James R. McVay, Kansas City, Cancer of the Gastrointestinal Tract.
Dr. Cyrus E. Burford, St. Louis, Urinary Stasis, A Common Cause of Destructive Tissue Change, Stone Formation and Bacterial Invasion.
Dr. Quitman U. Newell, St. Louis, Retrodisplacement of the Uterus.
Dr. Alphonse McMahon, St. Louis, Aminophylline, Its Uses and Its Effect Upon the Electrocardiogram.
Dr. Richard L. Sutton, Kansas City, Acne Vulgaris; New Concept of Etiology; Effective and Dependable Treatment: Acne Vulgaris; A Disturbance of Lipoid Metabolism.

The annual banquet of the academy of science will be addressed by Dr. McMahon on "What the Medical Profession is Doing to Care for Its Own Problems" and Edwin R. Walker, Central College, Fayette, "Philosophy and Science." Additional information may be obtained from Ray T. Dufford, Ph.D., 212 Physics Building, Columbia.

NEBRASKA

State Medical Meeting in Omaha.—The Nebraska State Medical Association will hold its annual session in Omaha, April 22-25, under the presidency of Dr. Arthur L. Miller, Kimball. The scientific program will open Tuesday morning with a symposium on obstetrics, presented, among others, by Drs. Carl P. Huber, Indianapolis; Morris Edward Davis, Chicago, and Willis E. Brown, Ann Arbor, Mich. A symposium on psychiatry will be presented Thursday afternoon by Drs. George A. Young, Richard H. Young, and Wilbur A. Muehlbig, Omaha; Juul C. Nielsen, Ingleside, and Harold Douglas Singer, Chicago. Other speakers will include:

Dr. Stuart W. Harrington, Rochester, Minn., Cancer of the Breast.
Dr. Theodore E. Sanders, St. Louis, Management of Ocular Trauma, with Particular Reference to Emergency Treatment.
Dr. Ernest E. Irons, Chicago, Non-Pneumococcal and Non-Tuberculous Pneumonias.
Dr. Nathan B. Van Etten, New York, Progress of Social Hygiene (round table discussion).
Dr. Armand J. Quick, Milwaukee, Therapeutic Value and Limitations of Vitamin K.
Dr. Ira H. Lockwood, Kansas City, Mo., Clinical and Roentgenologic Manifestations of Low Back Pain.
Dr. Warren H. Cole, Chicago, Present Day Concepts in Handling Gall-bladder Disease.

Entertainment will include a golf tournament, trap shoot and various alumni luncheons. The annual dinner Tuesday evening will be addressed by Dr. Edward J. McCormick, Toledo, Ohio, on "Present Social Trends and the Future of Medicine."

NEW YORK

New Regulations for Hotel Sanitation.—The Public Health Council has adopted amendments to the Sanitary Code requiring adequate maintenance of sanitary conditions in hotels, lodging houses and boarding houses, effective April 1. The regulations do not apply to hotels, lodging houses and board-

ing houses that are connected with both public water supplies and public sewerage systems. Establishments to which they do not apply are required to be equipped with adequate and safe supplies of drinking water and approved toilet and sewage disposal facilities. Other provisions of the new rules refer to the protection of food supplies, dish washing facilities and the reporting of suspected cases of communicable disease or unusual prevalence of illness.

Lectures for Practitioners.—The council committee on public health and medical education of the Medical Society of the State of New York is sponsoring two postgraduate courses during the spring. A course on hemorrhage arranged for the Tioga County Medical Society and presented in Owego and Waverly has the following speakers, all of the faculty of Long Island College of Medicine, Brooklyn:

- Dr. Richard H. Bennett, Pulmonary Hemorrhage, March 20.
- Dr. Albert F. R. Andresen, Hemorrhage, March 27.
- Dr. Mervyn V. Armstrong, Hemorrhage, April 3.
- Dr. Fedor L. Senger, Hematuria, April 10.
- Dr. Vincent R. Mazzola, Uterine Hemorrhage, April 17.

The other course is being presented for the Fulton County Medical Society at Gloversville by members of the faculty of New York University College of Medicine:

- Dr. Irving Graef, Cardiac Structure and Its Disorders, March 29.
- Dr. Charles E. Kossmann, Cardiac Functions and Their Disorders, April 5.
- Dr. Currier McEwen, Rheumatic Fever and Rheumatic Heart Disease, April 12.
- Dr. William Goldring, Hypertension and Hypertensive Heart Disease, April 19.
- Dr. Clarence E. de la Chappelle, Syphilitic and Arteriosclerotic Heart Disease, April 26.

New York City

Dr. Carey Will Give Brickner Lecture.—Dr. Eben J. Carey, dean and professor of anatomy, Marquette University School of Medicine, Milwaukee, will deliver the ninth Walter M. Brickner Lecture of the Hospital for Joint Diseases, New York, April 26. His subject will be "The Dynamics of Skeleto-Muscular Deformities."

Seventh Harvey Lecture.—Dr. Joseph T. Wearn, professor of medicine, Western Reserve University School of Medicine, Cleveland, will deliver the seventh Harvey Society Lecture of the current series at the New York Academy of Medicine, April 18. His subject will be "Morphological and Functional Alterations of the Coronary Circulation."

Lectures on Vitamins.—Mount Sinai Hospital is presenting a series of lectures on vitamins during April and May as follows:

- Selig Hecht, Ph.D., Vitamin A and Vision, April 4.
- Dr. Norman H. Jolliffe, Clinical Aspects of Vitamin B Deficiencies, April 17.
- Dr. Albert M. Snell, Rochester, Minn., Physiologic and Clinical Significance of Vitamin K, April 18.
- Dr. Gilbert Dalldorf, Valhalla, N. Y., Vitamin C, April 23.
- Dr. Hans P. Popper, Chicago, Vitamin A, April 25.
- Dr. Alwin M. Pappenheimer, Lesions of the Nervous System and Skeletal Muscles in Diet Deficient in Vitamin E, May 14.
- Dr. Benjamin Kramer, Brooklyn, Vitamin D—Formation, Clinical Pathology and Therapeutic Indication, May 21.
- Dr. William H. Sebrell Jr., Washington, D. C., Riboflavin, May 24.

NORTH CAROLINA

New Laboratory Dedicated.—A new \$200,000 building for the state laboratory of hygiene was dedicated in Raleigh, February 21, in memory of the late Dr. Clarence A. Shore, who organized the laboratory and directed it from 1908 to 1933. Speakers at the ceremony included Governor Hoey; Drs. John A. Ferrell, New York, associate director of the International Health Division of the Rockefeller Foundation; Sylvester D. Craig, Winston-Salem, president of the state board of health; John H. Hamilton, present director of the laboratory; Carl V. Reynolds, state health officer, and George M. Cooper, director of the division of preventive medicine, state health department.

OHIO

Changes in Health Officers.—Dr. Benedict B. Backley, Jacksonville, has been named health commissioner of the new combined Athens city and county health unit.—Dr. Francis R. Neff, London, has been appointed health commissioner of Madison County.

Annual Postgraduate Day.—The Mahoning County Medical Society will present its annual Postgraduate Day at the Ohio Hotel, Youngstown, April 24. The lecturers, all of Baltimore, will be:

- Dr. Warfield M. Fitor, Prevention and Treatment of Tetanus.
- Dr. Richard W. Telinde, Causes of Postmenopausal Bleeding.
- Dr. Benjamin M. Baker Jr., the Effect of Treatment of Headache.
- Dr. Lloyd G. Lewis, Urologic Significance of Hematuria.

District Meeting.—A meeting of the ninth councilor district of the Ohio State Medical Association was held in Jackson, March 7, with the following speakers, among others: Drs. Parke G. Smith, Cincinnati, president of the state association, on "Present Trends in Organized Medicine"; Jean P. Pratt, Detroit, "Role of the Endocrine in Gynecology," and Daniel P. Foster, Detroit, "Problems in the Management of the Diabetic Patient."

Society News.—Dr. Gabriel Tucker, Philadelphia, addressed the Mahoning County Medical Society, Youngstown, February 20, on diagnosis and treatment of tumors of the larynx.—Dr. George T. Pack, New York, addressed the Montgomery County Medical Society, Dayton, March 15, on "Diagnosis and Treatment of Tumors of the Stomach, Colon and Rectum."

—Dr. Alfred W. Adson, Rochester, Minn., addressed the Academy of Medicine of Toledo and Lucas County recently on "Chronic Recurring Sciatica Due to a Rupture of the Intervertebral Cartilage, with the Protrusion of the Nucleus Pulposus: Differential Diagnosis and Treatment."—Dr. Howard F. Root, Boston, addressed the Academy of Medicine of Cincinnati, March 19, on "Basic Principles in the Dietary Management of Diabetes Mellitus." Dr. Arthur C. Christie, Washington, D. C., was the speaker, March 5, on "The Diagnosis and Management of Cancer of the Breast."

An Osteopath Candidate for Coroner.—According to the April issue of the *Ohio State Medical Journal*, an Ohio osteopath initiated steps to have his name placed on the ballot at the Democratic primary election to be held in May as a candidate for the office of coroner for Darke County. The law provides that no person other than a licensed physician shall be eligible to the office of coroner in any county, with an exception not pertinent in this instance. A question was raised as to whether osteopath Kester was eligible to the office and the matter was submitted to the attorney general. In the opinion of this official, the word "physician" as used in the coroner law refers to a person licensed to practice medicine, and since the practice of medicine as ordinarily and popularly understood not only requires a knowledge of disease and its origin but in addition a knowledge of drugs, their preparation and action, an osteopathic physician, being by law denied permission to prescribe or administer drugs except anesthetics and antiseptics, is not eligible to the office of coroner. Osteopath Kester, understandably perhaps, was dissatisfied with the ruling of the attorney general and has filed an action in the Supreme Court of Ohio for a writ of mandamus to compel the Darke County Board of Elections to place his name on the ballot.

PENNSYLVANIA

Society News.—Dr. Earl D. Osborne, Buffalo, addressed the Lycoming County Medical Society, Williamsport, March 8, on "Newer Drugs in the Treatment of Syphilis and the Successes and Failures of Syphilis Programs" and Dr. Albert F. Doyle, Johnstown, of the state department of health, on "Recent Legislation Against Syphilis."—Dr. Dickinson Sergeant Pepper, Philadelphia, addressed the Washington County Medical Society, Washington, March 13, on "The Use of Sulfapyridine in the Treatment of Pneumonia."

Philadelphia

Gift in Honor of Dr. Pfahler.—The Philadelphia Roentgen Ray Society has contributed \$1,000 to the library of the College of Physicians of Philadelphia, the interest to be applied to the purchase of books on radiology. This gift is to be known as the "Fund of the Friends of George E. Pfahler." The fund was made up of the receipts over the expenses for a recent testimonial dinner for Dr. Pfahler, augmented by the society to make the full amount.

Society News.—Drs. Richard L. Masland and Bernard J. Alpers, among others, addressed the Philadelphia Pediatric Society, March 12, on "The Use of Dilantin in Epilepsy in Children" and "Brain Tumors in Infancy and Childhood" respectively.—Dr. Norman R. Ingraham Jr. addressed the American Society for the Study of Social and Criminal Delinquency, March 12, on "The Legal Aspects of Venereal Disease Control."—Dr. William E. Ehrlich, among others, addressed the Pathological Society of Philadelphia, March 14, on "Some Common but Infrequently Recognized Lesions of the Mouth and Pharynx."

Annual Postgraduate Institute.—The Philadelphia County Medical Society will present its Fifth Annual Postgraduate Institute at the Bellevue-Stratford Hotel, April 15-20. The general subject to be treated will be "Cardiology, Vascular and Nephritic Diseases." Seventy-five different specialists will conduct the courses. The registration fee is \$5. Luncheon speakers

will include the Hon. Robert E. Lamberton, mayor of Philadelphia; Dr. John J. Shaw, secretary of health of the Commonwealth of Pennsylvania; Dr. Francis F. Borzell, president-elect, Medical Society of the State of Pennsylvania, and Dr. George P. Müller, president of the American College of Surgeons.

WISCONSIN

Spring Clinic Programs.—The council on scientific work of the State Medical Society of Wisconsin has arranged the second annual clinic day sessions to be held in Wausau, April 24; Watertown, April 25, and La Crosse, April 26. The morning sessions will be devoted to clinics in surgery, medicine, pediatrics and dermatology, conducted by guest speakers. Dr. Geza de Takats, Chicago, will conduct a clinic on the treatment of varicose veins; Drs. Samuel A. Levine and Merrill C. Sosman, Boston, on valvular diseases of the heart; Albert Graeme Mitchell, Cincinnati, on malnutrition, and Paul A. O'Leary, Rochester, Minn., on diseases of the skin. In the afternoons there will be addresses by the following:

Dr. William D. Stovall, Madison, Wis., (1) Practical Clinical Application of Renal Functional Tests, and (2) Clinical Interpretation of Certain Serological Tests in Diagnosis of Communicable Diseases Including Syphilis.

Dr. O'Leary, (1) Oral Bismuth and Its Place in the Treatment of Syphilis, and (2) Eczema.

Dr. Sosman, Pitfalls in Gastrointestinal Fluoroscopy.

Dr. Mitchell, Common Endocrine Disturbances in Children.

Dr. John W. Harris, Madison, Management of Common Complications of Pregnancy.

There will also be round table discussions during dinner followed by evening sessions, at which Dr. de Takats will speak on peripheral vascular disease and Drs. Levine and Sosman will conduct clinical and roentgenologic conferences on cardiology.

GENERAL

Society of Clinical Surgery—Correction.—The annual meeting of the Society of Clinical Surgery will be held in St. Louis, April 29-30, and not in Nashville, Tenn., April 14-15, as noted in THE JOURNAL, March 23. The meeting described was that of 1939, a program of which was received recently. The sessions this year will be held at the Barnes Hospital and Washington University School of Medicine, St. Louis, and will include operations, motion pictures and presentation of cases.

The Kober Lecture.—Dr. William G. MacCallum, Baxley professor of pathology, Johns Hopkins University School of Medicine, Baltimore, delivered the annual Kober lecture at Georgetown University Medical School, Washington, D. C., March 28, on "Pathology of the Parathyroid Glands." He was presented with a certificate and honorarium of \$500 provided by the Kober Foundation. The speaker for this lecture is selected in alternating years by the Medical Society of the District of Columbia, the Association of American Physicians and the Association of Military Surgeons. The lecture commemorates the late Dr. George M. Kober, Washington, and is given on his birthday.

Society for Study of Asthma.—The annual meeting of the Society for the Study of Asthma and Allied Conditions will be held in Atlantic City, April 29. Among the speakers will be:

Drs. Warren T. Vaughan and David M. Pipes, Richmond, Va., A Study of Tissue Tension Responses in Urticaria and Angioneurotic Edema (the presidential address).

Drs. Robert A. Cooke, Stanley F. Hampton and William B. Sherman and Arthur Stull, Ph.D., New York, Sensitizations Induced by Tetanus Toxoid.

Dr. Stearns S. Bullen and Walter R. Bloor, Ph.D., Rochester, N. Y., A Chemical Method for Measurement of Adrenalin in the Blood.

Dr. Harry H. Donnelly, Washington, D. C., Does Culture Virus (Rivers) Result in Good Immunity?

Dr. George Piness and associates, Los Angeles, Relationships Between Foods as Shown by the Skin Test in 1,000 Children.

Drs. Louis E. Prickman and Herman J. Moersch, Rochester, Minn., The Diagnosis and Treatment of Bronchostenosis, an Important Complication of Asthma.

Grants for Research.—The Committee on Therapeutic Research of the Council on Pharmacy and Chemistry has available a fund to be expended in the promotion of investigations that may have therapeutic interest. Applications for grants are invited in this general field. The grants are limited to the purchase of materials or special apparatus. The application must contain adequate description of the research proposed, and an additional explanation if it is a continuation of an investigation which has been supported previously by some research fund. Each application must also contain a statement whether or not the work is supported in part by grants from any source other than that of the Committee on Therapeutic Research and, if so, the name of the organization making the grant and the amount of same. Applications should be sent to the secretary of the

Council, Paul Nicholas Leech, 535 North Dearborn Street, Chicago, on or before May 1. To expedite transmission to members of the committee it is asked that six copies (five carbon copies) of each application be sent. Action will not be taken until after all applications are received.

Special Society Elections.—Dr. Julian L. Rawls, Norfolk, Va., was chosen president-elect of the Southeastern Surgical Congress at the annual meeting in Birmingham, March 11-13; Dr. Herbert Acuff, Knoxville, Tenn., vice president, and Dr. Benjamin T. Beasley, Atlanta, Ga., secretary, reelected. Dr. Irvin Abell, Louisville, Ky., was installed as president. The 1941 meeting will be held in Richmond, Va.—At the recent annual meeting of the Federation of State Medical Boards of the United States in Chicago, Dr. J. Earl McIntyre, Lansing, Mich., was chosen president-elect and Dr. John R. Neal, Chicago, became president. Dr. John F. Hassig, Kansas City, Kan., was elected vice president and Dr. Walter L. Bierring, Des Moines, Iowa, reelected secretary.—Dr. Stanhope Bayne-Jones, dean, Yale University School of Medicine, New Haven, Conn., was elected president of the American Association of Pathologists and Bacteriologists at its annual meeting in Pittsburgh, March 21. Other officers include Drs. Samuel R. Haythorn, Pittsburgh, vice president; Howard T. Karsner, Cleveland, secretary, and Alan R. Moritz, Boston, treasurer. The next annual session will be held at New York University, New York, April 10-11, 1941.

CORRECTIONS

Number of Births at Jamaica Hospital.—Jamaica Hospital, Jamaica, N. Y., reported 981 births for the year 1939 instead of ninety-eight, which was incorrectly reported in the Hospital Number of THE JOURNAL, March 30, page 1231.

Highest Necropsy Percentages.—The Beverly Hospital, Beverly, Mass., which reported 118 deaths and eighty-five necropsies in 1939, a rate of 72 per cent, should have been included in the list of approved internship hospitals with the highest necropsy percentages, Table F, page 1172, in the Hospital Number of THE JOURNAL, March 30.

Government Services

Report on Health of Army

As in the preceding five years, motor vehicle accidents were the leading cause of death in the United States Army in 1938, according to the annual report of the surgeon general.

Injuries of all types caused 313 deaths and diseases caused 282. The leading causes, which were responsible for 70 per cent of all deaths, were: motor vehicle accidents 89, suicides 72, air transport accidents 55, diseases of the coronary arteries and angina pectoris 48, cancer and other malignant tumors 30, accidental drowning 22, pneumonia 29, appendicitis 18, tuberculosis 17, homicides 14, apoplexy 12 and accidental falls 11.

The strength of the army in 1938 was 182,815, about 7,191 more than in 1937. The average officer strength was 11,628.

The number of admissions to sick report was 99,086, which was 9 per cent less than in 1937, although the army strength was 4 per cent greater. The rate of admission, 542 per thousand of strength, is the lowest ever recorded.

Nasopharyngitis was the leading cause of admission to sick report as it has been during the past five years. The following conditions caused 45 per cent of all admissions in this order: nasopharyngitis, athletic injuries, bronchitis, acute tonsillitis, gonorrhea, chronic tonsillitis, accidental falls, enteritis and colitis, appendicitis, acute catarrhal pharyngitis, cellulitis and trichophytosis.

Gonorrhea headed the list of causes of loss of time, as it has every year since the World War, but in 1938 the number of days for treatment, 166,369, was 15 per cent less than the number in 1937. Athletic injuries were second in order, with 86,375 days lost, 22 per cent more than in 1937. The daily noneffective rate, 27.64, was the lowest recorded since 1917.

Retirements and discharges for physical disability were responsible for the separation of 136 officers and 2,025 enlisted men from the service. Among the enlisted men, 56.6 per cent of the discharges occurred within the first year of service. Some of the disabilities were incurred after entry into the service, but not many. Experience indicates that measures necessary to exclude men with actual or potential disability would probably not be economical.

The number of cases of venereal disease, 5,594, was about 6 per cent lower than in 1937 and the rate per thousand of

strength, 30.6, was the lowest ever recorded. Twenty-six per cent of the cases were syphilis; 64 per cent were gonorrhea. The highest rate was for white enlisted men in the Philippine Islands.

There were 318 cases of dengue, all in the Philippines except one in an officer in Puerto Rico. In the Philippines dengue appears to affect white men preponderantly and malaria the Filipinos.

Thirteen cases of typhoid occurred, nine in an outbreak traced to a native carrier at Fort Mills. Pneumonia, for some years the leading cause of death among diseases, was in third place in 1938. The case fatality rate was 3.7 as compared with 6.4 the previous year.

The number of surgical operations performed in 1938 was 25,366, including those on nurses. There were 3,646 tonsilectomies, 2,124 appendectomies and 857 herniotomies.

There were eighteen officers and 639 men invalided home from overseas garrisons.

The commissioned personnel of the Medical Corps of the army was increased by fifty officers during 1938, making the authorized strength by June 30, 1939, 1,132 officers. The average enlisted strength of the medical department was 8,464. The strength of the Medical Reserve Corps on June 30, 1939, was 23,339 officers.

During the last half of the fiscal year, steps were taken to revive reserve hospital units on the basis employed during the World War, that is, as units sponsored by medical schools or large civil hospitals from which the personnel for the professional services and part of the administrative officers were drawn.

One hundred and forty-three regular army officers completed various courses of instruction at the Army Medical School, the Medical Field Service School, the Army Dental School and the Army Veterinary School and twenty-one at other service schools. Twenty-nine medical officers took training at civil institutions. In addition, 11,625 officers, enlisted men and civilian employees were enrolled in extension courses and 2,186 students in medical R. O. T. C. units.

The Army Medical Museum reported 120,018 visitors during the year besides physicians who came to study. New methods of mounting specimens for display have been successfully used, notably the use of "lucite" for unbreakable specimen jars. Several accessions were received during the year, most important of which was the Huntington anatomic collection from Columbia University. Exhibits were prepared for various medical meetings. The registry of pathology continued to be active, loan sets being in great demand.

During the fiscal year 4,527 bound volumes were added to the library and subscriptions were entered for 250 additional journals. The librarian reports that the last available space for books has been used and that no more books can be received until arrangements are made to provide more space for them. Moreover, the crowded condition and the inadequate personnel make it impossible for the library to give the service demanded by modern library science and administration.

Meeting of Advisory Cancer Council

The National Advisory Cancer Council held its twelfth quarterly meeting, March 2, at the newly completed National Cancer Institute building near Bethesda, Md. Grants-in-aid were made to the University of Chicago, \$3,500 for investigation of cancer-causing substances; University of Michigan, \$450 for x-ray and neutron investigations; University of Cincinnati, \$4,020 for clinical studies of cancer of the stomach, and the Society of the New York Hospital, \$4,400 for general studies. Tentative grants were made to the Roscoe B. Jackson Foundation, Bar Harbor, Maine, for genetic studies and to Meharry Medical College, Nashville, Tenn., for statistical studies of cancer in Negroes. Reports were presented by Carl Voegtlin, Ph.D., chief of the National Cancer Institute, on research now in progress; Dr. Roscoe R. Spencer, assistant chief, on the so-called cancer cures that the institute is asked to investigate, and Dr. George M. Smith, Pine Orchard, Conn., a member of the council, on cooperative efforts in cancer research. Dr. Ludvig Hektoen, executive director of the council, reported on projects now being undertaken with federal aid, including studies in tissue metabolism at Cornell University Medical College, New York, and experimental studies on the origin of cancer in progress at the Barnard Free Skin and Cancer Hospital, St. Louis. Other topics discussed were a study of cancer of the skin to be undertaken by the National Cancer Institute and the possibility of issuing a revised publication dealing with the relief of pain in cancer patients.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 9, 1940.

Immunization Against Diphtheria

In this country immunization against diphtheria has never been practiced on a large scale as in the United States and Canada, but a memorandum on the subject issued by the Ministry of Health is an important step in that direction. About 60,000 cases of diphtheria are notified annually in England and Wales, and the average number of deaths is 3,000. Diphtheria occupies the seventh place among the causes of mortality in the first two years of life and at 4 years becomes the principal cause and remains so for the next six or seven years. It is thus the most common cause of death in children of school age, and no abatement of incidence or permanent reduction of mortality has taken place since the early years of the century. In 1910 the incidence per hundred thousand of population was 133 and the mortality under the age of 15 was 38.4; in 1930 the corresponding figures were 184 and 34 and, in 1937, 149 and 31.

Attempts to control the spread of diphtheria by compulsory notification, removal to a hospital and disinfection of rooms and bedding, have long reached the limit of usefulness. The reason is that diphtheria is most commonly conveyed directly from an infective person by droplets of moisture discharged into the air during coughing, sneezing or even during talking. The chief source of infection is the apparently healthy "carrier." In districts where diphtheria is endemic the infection is thus disseminated with the result that a large proportion of the population become immunized before the end of school life, but at a heavy cost in sickness and mortality. On the other hand, artificial immunization, carried out with proper precautions, involves no risk. The ministry states that the experience of the United States and Canada shows that if three fourths of the children at each age below 15 were immune and if this level was maintained year by year, the disease would be practically abolished. It therefore recommends that the advantages of immunization be brought to the notice of parents of children over 1 year of age, so that they may give the requisite consent for its performance. In early infancy, apart from the first few months, when a variable degree of passive immunity may exist, there is only a feeble resistance of the cells of the mucous membranes to the implantation of the diphtheria bacillus. Artificial immunization is therefore recommended as early in life as is practicable. Adults are considered to require immunization only in exceptional circumstances. Nurses and other members of the staff of fever hospitals are now protected with excellent results. It is recommended that immunized children be given a further dose of the prophylactic when they reach school age. In routine immunization a preliminary Schick test is not considered necessary. Four forms of diphtheria prophylaxis are produced in this country but can be sold only subject to satisfying the requirements of the Therapeutic Substances Regulations as to potency and freedom from toxicity.

For children under 8 years a dose of 0.1 cc. of alum precipitated toxoid followed after four weeks by 0.5 cc. is recommended. For older children and adults the first dose of 0.1 cc. serves to detect unusual sensitiveness. Two further similar doses should then be given at intervals of two or three weeks. But, if the person is not unduly sensitive, the same procedure as for younger children should be followed. In all cases a Schick test should be done not less than two months after the last injection. It will usually be found that a few of these

given the ordinary course varying from 1 to 10 or 15 per cent are still susceptible. Such persons should be subjected to a second similar course and again tested not less than four weeks later.

PARIS

(From Our Regular Correspondent)

Feb. 25, 1940.

Trench Foot

Christian Champy and Roger Goujard discussed before the Academy of Sciences and the Academy of Medicine the role of vitamin B deficiency in trench foot, which has again made its appearance. The symmetry of the lesions, the fact that only certain army units and certain classes of troops are troubled by it, its frequency in alcoholic persons and the effect of the cold season have always pointed to an internal agent, probably vitamin B deficiency. If this assumption is true, it would account for the localization of the lesion under the influence of a physical cause acting peripherally. Unlike beriberi, trench foot is not usually accompanied with generalized neuritis. After subjecting animals to a regimen deficient in vitamin B, they exposed them to conditions similar to those of the soldiers in the trenches. Controls were used and were given the same diet but without exposure to cold. The authors found that the accidents of vitamin B deficiency appeared much earlier in animals exposed to cold. They believe that the process of thermogenesis activates a larger consumption of glucides, in the production of which, it is generally agreed, the effect of vitamin B can be recognized. The edemas of trench foot are attended by degenerative processes in the sciatic nerve, while phenomena of general neuritis are not in evidence. Their conclusion is that trench foot is preceded by a vitamin B deficiency and that the best prophylaxis consists in supplying regular doses of this vitamin. Other measures would include the elimination of tight fitting equipment and the furnishing of water tight shoes.

Leriche, who conducted studies on trench foot at the Centre de recherches de chirurgie vasculaire of Lyons, thinks that trench foot is an excellent example of a functional disorder followed shortly after by a definite anatomic condition. A large number of cases recently observed by him originated in vasomotor conditions. When men with frostbitten feet remove their boots in a warm room, a painful edema of considerable extent appears, with a rapid rise in the oscillometric index if the lesion is unilateral. This is followed by phlyctenae at the extremities of poorly vascularized toes and by stubborn gangrenes. A second observation is that of stoppage involving the arteries. Men afflicted with trench foot are arthritic to the point that long after healing they often suffer ischemic crises and cyanosis of the feet in winter. Leriche recommends infiltration anesthesia of the sympathetic nerve as a systematic treatment of urgency. Stricker and Buck obtained immediate alleviation and accelerated cures by means of lumbar infiltration.

War Psychosis

The war has not been without its effect on the minds of the French people. In one of the last sessions of the Société médico psychologique the alienists exchanged their views on the connection between mobilization, war and psychopathic reactions. Cases at the outbreak were rare and mostly of a hallucinatory character. Most of them were cured after shorter or longer isolation. Among them were a certain number (four out of eighty-two according to the statistics) who showed a mental condition due either to the war or to events that had activated their dementia or developed incidents that justified their isolation. Those hospitalized showed only transient excitements. In general, they were indifferent and many even denied the existence of the war. War, accordingly, did not appreciably modify psychopathic conditions. However, in some

officers states of anxiety were observed, born of the fear lest they could not meet their responsibilities. At times, delirium sprang from resistance to measures necessitated by the "black-out" or on occasions when alarms were sounded. Tanon described under the name of "gas obsession" some forty cases in which persons appeared at aid stations alleging that they had breathed yperite or some other toxic gas. Similar conditions noted in soldiers were often due to the influence of alcohol. Laignel-Lavastine estimates that 90 per cent of the cases could be accounted for by alcohol.

Another aspect of the influence of the war is the simulation of incapacity among soldiers. This ranges from exaggerations of real symptoms to the creation of all kinds of morbid phenomena.

Hereditary Absence of Uterus

Pierre Delbet presented before the Academy of Medicine the family tree of a family in which, during successive generations, six girls were born without a uterus. All were normal, possessed secondary sex characteristics and were married. None had ever menstruated. Their vagina ended in a cul-de-sac, without any cervical vestige. The first of these women had lived more than a hundred years. She had had two sisters and one brother. One of the sisters had a daughter, who in turn had five daughters. The third and fifth of these were born without a uterus. The first and the fourth were normal. One of the daughters of the first of the sisters had a daughter without a uterus. The fourth of these sisters had two normal daughters. The second of these two daughters is the mother of five girls, two of whom have no uterus. Incidentally, the family tree of this family showed an extraordinary predominance of boys. Absence of the uterus, Delbet said, is a mutation of a recessive nature. However, in order that a recessive character may appear, the two sex chromosomes of the father and the mother must show it. One must accordingly assume that the female chromosomes may transmit recessive characters and that the male chromosomes, owing to a modification or some other reason, are favorable to this transmission. However, this is inconceivable and counter to the chromosome theory. Geneticists propose different explanations of analogous cases but these, according to Delbet, are based on assumptions.

Cancer of the Tongue

J. L. Roux-Berger and André Tailhefer, who made a study for the Curie Foundation, presented a report before the Journées cancerologiques de Liège on cancer of the mobile part of the tongue. Of 494 cases studied, only 2 per cent could not be traced; the remainder could be carefully studied for several years.

A threefold method of treatment was employed. A group of 185 patients were treated only with radiation; of these, 19 per cent recovered. A second group was treated surgically as well as radiologically. Of these, 22 per cent were found to be well in the fifth year; fourteen died of recurrence. Of thirty-six patients in whom an initial clinical adenopathy was encountered only 16 per cent were cured. Surgery alone was performed on forty-two patients and showed 45 per cent of cures after the fifth year. The high percentage of cures attained by the combined methods of treatment led to the adoption of this method at the Curie Foundation.

An analysis shows that it is difficult to make a diagnosis of the conditions of the glands and that carcinomas of the tongue the ganglions of which are affected quite often can be cured. Surgical treatment of carcinomatous recidivations was successful in 25 per cent of the cases. Local and regional anesthesia is generally employed. One must not fear to operate on both sides. In spite of improvements in technic, surgery of the carcinoma of the mobile part of the tongue lacks precision.

BUENOS AIRES

(From Our Regular Correspondent)

Feb. 28, 1940.

Psittacosis in Argentina

The first epidemic of psittacosis was diagnosed clinically by Barros of Cordoba in 1929. Since then distinct isolated outbreaks have been observed, in 1935 in Tandil, Mendoza and Bahia Blanca, and in 1939 in Buenos Aires. This last outbreak caused great publicity in the newspapers owing to the large number of cases and deaths. In 1938 Dr. Zuccarini was infected while studying the disease in the laboratory. In 1938 Australian parrots (*Melopsittacus undulatus*) on sale were found infected, and in the majority of cases it has been proved that this species is the transmitter of the disease to man, and also the origin of human epidemics. In 1937 by government decree it became compulsory to report the disease and in 1938 the importation of parrots was forbidden, except those for zoological gardens or scientific institutes.

In the first cases the diagnoses were confirmed by Drs. Betson or Mayer by means of the complement fixation test. In more recent cases Sordelli and Zuccarini (*Rev. d. Inst. bact.*, Buenos Aires 9:99, 1939) have been able to make the diagnosis by inoculating the blood of patients, preferably taken the third day of the disease, into the peritoneum of mice, and looking for Lewinthal corpuscles in the spleen, after about fifteen days. An interesting development is the diagnosis by inoculation of the sputum obtained on the seventh day, which is either filtered through a Chamberland filter or sulfapyridine is added, which prevents the death of mice by other micro-organisms but allows the evolution of the psittacosis. This is an easy diagnostic method.

Romaña's Sign for the Diagnosis of Trypanosomiasis Americana

In 1909 Chagas discovered *Schizotrypanum cruzi* in human blood in Brazil and described trypanosomiasis americana, which is now called Chagas' disease. Up to 1934, according to Reichenow, thirty-six cases had been found outside Brazil, twenty-one of these occurring in Argentina. In October 1935 Dr. Cecilio Romaña described a diagnostic sign, which consists of unilateral ophthalmia, characterized by three symptoms: palpebral edema, conjunctivitis and swelling of the regional lymph glands. This ophthalmia can be attributed to a local inoculation of the conjunctiva due to the excreta of *Triatoma* and has been reproduced experimentally in the monkey by Dr. Romaña.

This clinical sign has been the means of diagnosing a larger number of cases; thus 139 new cases were found in Argentina in ten months from August 1936 to June 1937. In 1938 the University Mission described 300 cases and by now has registered more than 500 human cases. The name Romaña's sign was given by Dr. Evandro Chagas (son of Carlos Chagas) and Emmanuel Dias in discussing a communication by Romaña in October 1935. According to Emmanuel Dias (*Brasil-med.* 53:965 [Oct. 14] 1939) the discovery of Romaña's sign is the most important contribution made toward the study of Chagas' disease outside Brazil.

In two papers, S. Mazza (*Prensa méd. Argent.* 26:1569 [Aug. 16] 1939, 27:401 [Feb. 21] 1940) maintains that Carlos Chagas had already observed unilateral or bilateral palpebral edema, a sign that is by no means constant. He believes that the edema is not due to a local infection of the conjunctiva but to a localization of a general infection originating in some other part of the body. He affirms that Bayer's 7602 has a definite therapeutic activity in trypanosomiasis americana and that it can be considered as a specific remedy for this disease. Atabrine, on the other hand, which is advised by some authors, has no effect.

A National Central Hospital for Tuberculosis

The municipality of Buenos Aires has one special hospital, the Tornu (director Dr. A. Raimondi), and a large part of the Muniz Hospital for the care of tuberculous patients. The National Benevolent Society supports an important hospital in General Rodriguez, near Buenos Aires. The National Commission of Homes and Regional Hospitals has three large hospitals: Santa Maria and Domingo Funes (Cordoba) and another in La Rioja. The University of Cordoba has a chair of phthisiology directed by Prof. Raul Vaccarezza in a splendid building in the Muniz Hospital. There is also one institute for researches in phthisiology, directed by Professor Izzo in the Tornu Hospital. A great hospital is in construction in Buenos Aires which will depend on the Argentine League Against Tuberculosis. Besides these there are many dispensaries, homes for the children of consumptives and special wards in some hospitals.

One of the most serious difficulties of the antituberculosis campaign is the dependence on four or five official institutions which are independent of one another. To combine them, congress has passed a law which creates the National Commission for Tuberculosis.

Since there is no ministry of public health, and one cannot be established without an amendment of the constitution, the government has tried to combine two of the big official health organizations and has appointed Dr. J. J. Spangenberg president of the National Health Department and of the Commission of Homes and Hospitals. As an immediate consequence of this a national plan for the preventing of tuberculosis has been prepared and started with the opening, February 18, of a National Central Hospital for Tuberculosis in the buildings formerly occupied by the Military Hospital. The new hospital is directed by Dr. A. Cetrangolo, a well known specialist in tuberculosis.

ITALY

(From Our Regular Correspondent)

Feb. 15, 1940.

Congress of Internal Medicine

The forty-fifth congress of the Società italiana di medicina interna was held recently at Naples. Prof. Edoardo Maragliano, a senator and the president of the society, spoke on the modern trends of medical education in Italy. It is advisable to simplify research on biology in order to obtain more rapid results in interpretation of biologic phenomena and to include in medical studies only biologic facts which are already established on scientific grounds. It is advisable to give more importance to the teaching of certain medical subjects a thorough knowledge of which is indispensable in medicine and its branches. Roentgenology, physical therapy and phthisiology are at present classed as complementary selective subjects when they should be fundamental and compulsory subjects in medical curriculums.

The first official topic of the congress was lipoidosis. Professor D'Amato, with Rutishauer, classified lipoidoses into local and general. He found by clinical studies that the lesions of the nervous system and of the hypophysis are of primary importance in the development of the condition. It has been found also that perivascular fibroblasts, reticulo-endothelial cells and microglia take a part in the formation of foamlike cells. These studies point out the role of associated disturbances of the reticulo-endothelial system and the metabolism of lipoids in the pathogenesis of Christian's syndrome. The chemical analysis of the removed portion of a xanthoma showed a great amount of cholesterol in the tissues, especially esterified cholesterol. Prolonged glandular therapy in the course of a diet poor in fats failed.

Professor Bossa differentiated lipoidoses into phosphatic, cerobroside and cholesterol lipoidoses. He believes it advisable to

call phosphatic and cerebroside lipoidoses by the names of phosphatidosis and cerebrosidosis. Gaucher's disease, the only form of cerebrosidosis known, is characterized by a great accumulation of ceresine in some internal organs, especially the spleen. The lipoids accumulated in the tissues in cholesterosis are mixed with predominance of cholesterol and cholesterol esters. Experimental research has shown that disturbances of the metabolism of vitamins in the pathogenesis of lipoidosis is secondary.

The second official topic was the treatment of decompensated heart disease. The speakers were Professors Gamma, Giordano and Croveti of the University of Turin. Professor Gamma said that the medical treatment of decompensated heart disease has two aims, the prevention and repair of decompensation. In preventing decompensation it is advisable to establish a proper way of living for the patient. The treatment of decompensation is carried out by placing the patient at complete rest and at the same time by withdrawing, as indicated, blood or fluids. Digitalis, or strophanthin intravenously, is indicated in insufficiency and dilatation and hypertrophy or auricular fibrillation.

Professor Croveti discussed the treatment of cardiac decompensation. He does not believe in administering digitalis to persons with normal hearts who are to have a surgical operation or go through childbirth. Total thyroidectomy as a treatment for chronic cardiac decompensation is of theoretical rather than of practical value. The roentgen irradiation of the thyroids and other similar treatments are of no therapeutic value in decompensation. The next congress will take place in Rome.

National Congress of Surgery

The forty-sixth congress of the Società italiana di chirurgia was held at Naples simultaneously with the congress of internal medicine. The first official topic was abdominal trauma. Dr. Ceccarelli, professor of clinical surgery at the University of Padua, said that the most frequent causes of abdominal trauma during the last century were kicks by horses, whereas nowadays mechanical, industrial and automobile accidents are the most frequent. Traumatic abdominal lesions may be parietal, visceral or parietovisceral. Often they are associated with fractures of the ribs or the pelvis or rupture of the bladder. The development of gastroduodenal ulcer from external abdominal trauma is rare. Appendicitis may develop if several coadjuvant factors exist. In making a diagnosis it is important to differentiate the symptoms of alarm from those of certainty. If there are doubts about the extension and nature of the lesion and about the indications or contraindications of an immediate surgical operation it is advisable to watch the patient for results of immediate medical treatment. If the general and local conditions improve from medical treatment, the operation may not be necessary. An exploratory laparotomy is indicated if the symptoms are not modified by medical treatment several hours after trauma. Unjustified delay in operating may aggravate the prognosis by the hour. The mortality rate in rupture of the intestine varies between 80 and 100 per cent twenty-four hours after rupture. The preoperative treatment in abdominal trauma consists in improving the general condition of the patient by resorting to proper available means, especially blood transfusion.

The second official topic was surgery on the adrenals. Professor Durante of the University of Genoa said that the secretory functions of the adrenals can be reduced or arrested, without diminishing the adrenal parenchyma, by any of five different surgical operations: (1) neurotomy of the splanchnic nerves with consequent adrenal denervation, (2) lumbo-aortic, celiac or thoracic ganglionectomy, also with consequent denervation, (3) juxtalymphonodular denervation and ligation of either (4) the adrenal arterial peduncle or (5) the capsular vein. The secretory adrenal functions can be reduced with diminution of the cortical and medullary parenchyma by (1) partial or total unilateral adrenalectomy, (2) total unilateral or partial contra-

lateral adrenalectomy or (3) partial bilateral adrenalectomy. They can be reduced with diminution of only the medullary parenchyma by medullectomy. Means for stimulating directly the adrenal secretory functions are unknown. Indirectly, they can be stimulated through decortication of the carotid bulb. He discussed the results he obtained from adrenalectomy in the treatment of syndromes of medullary or cortical hyperadrenalism, including endarteritis obliterans, as well as in essential epilepsy, diabetes, tumors and tuberculosis of the adrenals. Since 1935 he has resorted to medullectomy in the treatment of twenty-four patients suffering from syndromes of medullary hyperadrenalism.

The third topic was Banti's disease. Professors Cesa-Bianchi and Cellina of Milan spoke from the medical point of view. They found, by clinical observations and pathologic studies, that splenomegaly is the condition of primary importance in the pathogenesis of bantian syndromes. Disturbances of tonus of the spleen and of the intraparenchymal arterial pressure are influential in the development and establishment of splenomegaly. Processes of local congestion and of arterial blood engorgement are stimulated by the factors which induce splenomegaly with resultant disorders of hemopoiesis and the development of splenic anemia that Banti observed for the first time.

Professors Castiglioni and Pettinari spoke from the surgical point of view. Professor Castiglioni reviewed the results of surgery in all cases of bantian and similar syndromes reported after the 1926 congress. He reported in detail the results of surgical interventions in seventeen cases of bantian syndromes of his own practice. He concluded that the treatment of the condition is surgical whenever advisable. Splenectomy or ligation of the splenic artery is the indicated surgical procedure.

Professor Pettinari discussed the normal spleen as a structure of physiologic protection (by neutralizing or arresting improper substances). Any material which leaves the spleen passes to the liver. Both structures form a system with related lymphatic, nervous and circulatory routes. The proliferating substances of connective tissue of the spleen, which are produced during splenic autolysis, pass to the liver through the portal vein with consequent development of cirrhosis of the liver.

Professor Alessandri has operated on the spleen in 109 cases. Splenectomy was performed in seventy-nine cases and ligation of the splenic artery in seventeen cases. He pointed out the importance of collaboration between physicians and surgeons as carried on in the United States, with special reference to surgery of the spleen in the spleen clinic at Columbia University. Professor Puccinelli reported results of splenectomy in sixty-four cases. In twenty cases the operation was resorted to for the treatment of bantian syndromes. The rate of mortality in his cases was 20 per cent.

The next congress will be held at Rome. The following official topics will be discussed: (1) pyogenic general infections, (2) tuberculosis of genital apparatus in man and (3) treatment of open fractures of lower extremities, especially fractures with lesions of firearms.

Marriages

FRANK WALTER QUATTLEBAUM, Pavo, Ga., to DR. JANE ELIZABETH HODGSON of Crookston, Minn., February 22.

HIRAM PHELPS SALTER, Bronxville, N. Y., to Miss Elizabeth Guion of New Rochelle, January 16.

EDGAR WILLIS LACY JR., Pulaski, Va., to Miss Alma Covell Pancake of Romney, W. Va., January 20.

GIBSON LEWIS SIKES, Salemburg, N. C., to Miss Margaret Lee MacLeod of Cameron, Dec. 22, 1939.

FRANK WILSON JR., Raleigh, N. C., to Miss Alice Rogers Barbour of Clayton, February 2.

DAVID REID WEIR, Cleveland, to Miss Arria Morison of Boston, March 8.

Deaths

Ferdinand Claiborne Walsh ☉ Hunt, Texas; University of Virginia Department of Medicine, Charlottesville, 1899; past president of the Bexar County Medical Society; member of the American Urological Association; demonstrator in genito-urinary diseases at the Georgetown University School of Medicine, Washington, D. C., from 1903 until 1906, and during the same period was assistant in the department of surgery, Georgetown University Hospital, Washington, D. C.; fellow of the American College of Surgeons; on the staff of the Santa Rosa Hospital, San Antonio, and the Robert B. Green Memorial Hospital, San Antonio; aged 62; died, February 15.

Walter Whitney Boardman ☉ San Francisco; Cooper Medical College, San Francisco, 1909; instructor of medicine and director of actinography, Stanford University School of Medicine, in 1912, assistant professor of medicine in 1914, associate professor from 1915 to 1918, later associate clinical professor and clinical professor of medicine; fellow of the American College of Physicians; served during the World War; aged 56; died, February 11, in the Stanford Hospital of carcinoma of the rectum.

Julius Frischer ☉ Beverly Hills, Calif.; University Medical College of Kansas City, Mo., 1905; member of the Missouri State Medical Association and the American Urological Association; formerly urologist to the Grace Hospital, General Hospital and the Menorah Hospital, Kansas City, Mo.; served during the World War; aged 53; died, February 21, of coronary thrombosis.

Perle Clifton Irwin ☉ Seattle; State University of Iowa College of Medicine, Iowa City, 1904; fellow of the American College of Surgeons; on the staffs of St. Luke's Hospital and the Providence Hospital; veteran of the Spanish-American War; fire department physician; aged 63; died, February 12, following an operation for carcinoma of the colon.

Jesse D. Edwards, Siler City, N. C.; Louisville (Ky.) Medical College, 1887; member of the Medical Society of the State of North Carolina; past president of the Chatham County Medical Society; formerly mayor and member of the state legislature; aged 78; died, February 18, of coronary thrombosis, myocarditis and hypostatic pneumonia.

Faneuil Suydam Weisse ☉ Winter Park, Fla.; Columbia University College of Physicians and Surgeons, New York, 1900; member of the Medical Society of the State of New York; formerly medical director of the Mutual Life Insurance Company of New York; aged 64; died, February 24, of chronic myocarditis and diabetes mellitus.

Glenn W. Stockwell ☉ Detroit; Detroit College of Medicine, 1903; formerly assistant clinical professor of surgery at his alma mater; fellow of the American College of Surgeons; member, adjunct staff, Harper Hospital; served as surgeon for the city fire department; aged 60; died, February 19, of carcinoma of the sigmoid.

Malvin M. Hauge, Clarkfield, Minn.; Minneapolis College of Physicians and Surgeons, 1907; owner and medical director of the Clarkfield Community Hospital; member of the Minnesota State Medical Association; fellow of the American College of Surgeons; aged 63; died, January 31, of myasthenia gravis and diabetes mellitus.

Ralph Willis Nutter, New York; University of Vermont College of Medicine, Burlington, 1916; member of the Medical Society of the State of New York; on the staffs of the New York Nursery and Child's Hospital, Manhattan Maternity Hospital and the French Hospital; aged 47; died, February 26, of heart disease.

John Colin Vaughan, New York; Columbia University College of Physicians and Surgeons, New York, 1907; formerly instructor in anatomy and surgery at his alma mater; fellow of the American College of Surgeons; at one time attending surgeon to the Grant County Hospital, Marion, Ind.; aged 64; died, January 12.

Charles Overton Burruss, Sharon, S. C.; University of Maryland School of Medicine, Baltimore, 1906; member of the South Carolina Medical Association; aged 58; died, February 27, in the Mercy Hospital, Charlotte, N. C., of essential hypertension, arteriosclerosis and cerebral hemorrhage.

Arthur Munson Macnamee, Batavia, Ohio; Georgetown University School of Medicine, Washington, D. C., 1898; member of the Medical Society of the District of Columbia; veteran of the Spanish-American and World wars; aged 65; died, February 7, of rheumatic endocarditis.

Benjamin Henry Bascum Hubbard, White Stone, Va.; University of Maryland School of Medicine, Baltimore, 1895; member of the Medical Society of Virginia; for many years member of the U. S. Public Health Service; formerly bank president; aged 65; died, January 7.

Frederic Storchheim, Wauwatosa, Wis.; Rush Medical College, Chicago, 1929; member of the State Medical Society of Wisconsin and the American Psychiatric Association; on the staff of the Milwaukee Asylum for Chronic Insane; aged 48; hanged himself, Dec. 8, 1939.

Beverly Freeland Moseley, Hattiesburg, Miss.; Medical College of Alabama, Mobile, 1900; member of the Mississippi State Medical Association; aged 68; died, February 14, at the Methodist Hospital of burns received when his clothes caught fire from a bathroom heater.

Emmett A. Pickens, Bentonville, Ark.; University of Arkansas School of Medicine, Little Rock, 1909; member of the Arkansas Medical Society; past president of the Benton County Medical Society; formerly county health officer; aged 66; died, January 29, of heart disease.

Abner G. Greenstreet, Seattle; Columbian University Medical Department, Washington, D. C., 1900; member of the Washington State Medical Association; past president of the Puget Sound Academy of Ophthalmology and Otolaryngology; aged 76; died, January 1.

George Byron Whitmore ☉ Surgeon Lieut. Commander, U. S. Navy, retired, Coral Gables, Fla.; Jefferson Medical College of Philadelphia, 1903; entered the navy in 1908 and retired in 1922 for incapacity resulting from an incident of service; aged 59; died, January 20.

James Robert Rogers, Brownington, Mo.; University Medical College of Kansas City, 1909; member of the Missouri State Medical Association; aged 55; died, Dec. 13, 1939, in the Trinity Lutheran Hospital, Kansas City, of perforated gastric ulcer and peritonitis.

Omer Oral Gain, Dublin, Texas; St. Louis College of Physicians and Surgeons, 1910; member of the State Medical Association of Texas; served during the World War; member of the school board; aged 62; was killed, February 27, in an automobile accident.

Lemuel Jones Godbey, Lexington, Ky.; Kentucky School of Medicine, Louisville, 1898; served during the World War; member of the American Psychiatric Association; aged 69; on the staff of the Veterans Administration Facility, where he died, January 10.

Frank E. Kauffman ☉ Clearwater, Fla.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1897; an Affiliate Fellow of the American Medical Association; aged 71; on the staff of the Morton F. Plant Hospital, where he died, January 29.

Frank M. Knight, Alliance, Neb.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1882; aged 82; died, January 12, in the Methodist Hospital, Omaha, of gangrene of the right leg and thigh, thrombosis and bronchopneumonia.

Clarence Ambrose McGuire, Dubuque, Iowa; St. Louis College of Physicians and Surgeons, 1909; member of the Iowa State Medical Society; served during the World War; aged 51; died, February 3, in the Mercy Hospital of ruptured aortic aneurysm.

Arthur Wellesley Foshay ☉ Piedmont, Calif.; University of California Medical Department, San Francisco, 1904; aged 63; died, January 13, in the Providence Hospital, Oakland, of lobar pneumonia, chronic endocarditis and diabetes mellitus.

James Thomas Flanagan, Brooklyn; Johns Hopkins University School of Medicine, Baltimore, 1908; member of the Medical Society of the State of New York; served during the World War; aged 57; was found dead, February 28.

Campbell Davidson, Qualicum Beach, B. C.; McGill University Faculty of Medicine, Montreal, Que., 1898; for many years medical officer of health and medical school inspector; aged 62; died, February 16, of coronary disease.

Ottis Like, Monroe City, Ind.; Washington University School of Medicine, St. Louis, 1911; served during the World War; aged 58; died, February 21, at the Wilgus Sanitarium, Rockford, Ill., of cardiovascular renal disease.

Joseph Stephen Terrando ☉ La Salle, Ill.; Regia Università degli Studi di Parma. Facoltà di Medicina e Chirurgia, Italy, 1903; aged 67; on the staff of St. Mary's Hospital, where he died, February 20, of coronary thrombosis.

James Milton Miller, Decatur, Ind.; Medical College of Ohio, Cincinnati, 1886; member of the Indiana State Medical Association; formerly city health officer and county physician; aged 79; died, February 16, of myocarditis.

Henry Krogstad, Washington, D. C.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1888; New York Homeopathic Medical College and Hospital, 1889; aged 81; died, January 23, at Richmond, Va.

Louis George Pinault, Campbellton, N. B., Canada; Laval University Faculty of Medicine, Quebec, 1898; fellow of the American College of Surgeons; on the staff of the Hotel Dieu Hospital; aged 66; died, January 8.

David Harry R. Patton Ⓢ Chicago; Baltimore Medical College, 1896; on the staffs of the Illinois Masonic Hospital and the Woodlawn Hospital; aged 72; died, February 28, of myocarditis and coronary sclerosis.

Leon J. Tunitzky, Philadelphia; Temple University School of Medicine, Philadelphia, 1910; on the staffs of the Northern Liberties Hospital, Woman's Hospital and the Homewood School; aged 60; died, January 9.

William Thomas Tanner, Oneida, N. Y.; University of Buffalo School of Medicine, 1884; formerly county coroner; veteran of the Spanish-American War; aged 76; died, Dec. 4, 1939, of cerebral hemorrhage.

John Robert Sigler, Corydon, Ky.; University of Louisville Medical Department, 1877; aged 88; died, February 10, in the Welborn-Walker Hospital, Evansville, Ind., of hypertrophy of the prostate and uremia.

Thomas Wallbank Preston, Balfour, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; aged 83; died, January 4.

John L. Bostwick, Hulett, Wyo.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; aged 66; died, February 18, in the McHenry Hospital, Gillette, of cirrhosis of the liver.

William James Innes, Atlanta, Ga.; University College of Medicine, Richmond, 1901; past president and secretary of the Lee County, Va., Medical Society; aged 75; died, February 10, at Marion, Va.

William S. Applegate, Parsippany, N. J.; Jefferson Medical College of Philadelphia, 1883; member of the Medical Society of the State of New York; aged 87; died, February 6, of arteriosclerosis.

Arne Zetlitz, Long Beach, Calif.; Toledo Medical College, 1891; formerly a practitioner in Sioux Falls, S. D.; aged 75; died, February 5, of cerebral hemorrhage, arteriosclerosis and paralysis agitans.

Mareva Dickerman Brown, De Kalb, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1898; member of the Illinois State Medical Society; aged 77; was found dead, February 8.

Hamilton H. Tyndale, Salt Lake City; Columbia University College of Physicians and Surgeons, New York, 1933; intern at St. Mark's Hospital; aged 34; was found dead, Dec. 20, 1939.

Paul Joseph Moloney, Ottawa, Ont., Canada; Trinity Medical College, Toronto, 1893; associate professor of hygiene at the University of Toronto Faculty of Medicine; died, Nov. 12, 1939.

Frank Osgood Bumgarner Ⓢ Pittsburgh; Medico-Chirurgical College of Philadelphia, 1904; aged 61; died, January 17, in the Mayview Hospital of arteriosclerotic heart disease.

Allan Graham Hurdman, Ottawa, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1901; L.R.C.S., and L.R.C.P., Edinburgh, Scotland, 1903; aged 62; died, Dec. 11, 1939.

Ira Dietrich Heckman Ⓢ Coral Gables, Fla.; Jefferson Medical College of Philadelphia, 1920; member of the Medical Society of the State of Pennsylvania; aged 45; died, January 27.

Albert Rit Conrad, Caruthersville, Mo.; University of Tennessee Medical Department, Nashville, 1889; member of the Missouri State Medical Association; aged 76; died, February 2.

Robert H. Lasater Ⓢ Lawson, Texas; Memphis (Tenn.) Hospital Medical College, 1895; aged 86; died, February 19, in Dallas of benign hypertrophy of the prostate and arteriosclerosis.

Minda Agnes McLintock, Atchison, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1888; member of the Kansas Medical Society; aged 83; was found dead, January 5.

Edward C. Love, Calistoga, Calif.; California Medical College, San Francisco, 1895; aged 68; died, January 18, in the Samuel Merritt Hospital, Oakland, of coronary thrombosis.

John F. Freeman, Atlanta, Ga.; Chattanooga (Tenn.) Medical College, 1892; member of the Medical Association of Georgia; aged 71; died, February 28, of bronchopneumonia.

Joseph Kittredge, North Andover, Mass.; Harvard Medical School, Boston, 1880; member of the Massachusetts Medical Society; aged 81; died, January 31, of cerebral thrombosis.

Ernest Folger Pope, Boston; Colorado School of Medicine, Boulder, 1902; member of the Massachusetts Medical Society; served during the World War; aged 65; died, January 26.

Harold Blaine Scovern Ⓢ Carrollton, Mo.; Jefferson Medical College of Philadelphia, 1915; member of the board of education; aged 48; died, February 14, of heart disease.

Victor Geoffrion, L'Assomption, Que., Canada; School of Medicine and Surgery of Montreal, 1893; registrar of L'Assomption; at one time mayor; died, January 10.

Leonard John Nilles Ⓢ Rollingstone, Minn.; University of Minnesota Medical School, Minneapolis, 1936; aged 37; died, February 2, at Winona of rheumatic heart disease.

George Charles Kasdorf, Michigan City, Ind.; Long Island College Hospital, Brooklyn, 1907; aged 68; died, February 21, in St. Anthony Hospital of cerebral hemorrhage.

Daniel Raymond McNally, Providence, R. I.; Boston University School of Medicine, 1906; member of the New England Roentgen Ray Society; aged 56; died, January 8.

Henry Clay Scarlett, Greensboro, N. C.; Meharry Medical College, Nashville, Tenn., 1907; aged 54; died, January 25, of hypertension and cardiovascular renal disease.

George Wilson Staples, St. Claude, Man., Canada; Manitoba Medical College, Winnipeg, 1896; aged 78; died, February 23, in Carman of carcinoma of the stomach.

Nereus Cook Kemp, Ossining, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1886; aged 78; died, January 18, of coronary thrombosis and arteriosclerosis.

Sara Isabell Barnard, Steelville, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1899; aged 72; died, February 1, in Portage Des Sioux of carcinoma.

James Ward Slattery Ⓢ Mountain View, Calif.; College of Medical Evangelists, Los Angeles, 1933; aged 42; died, January 19, of chronic valvular heart disease.

Elmer E. Fowler, Oak Hill, Ohio.; Starling Medical College, Columbus, 1897; aged 76; died, February 4, in the Athens (Ohio) State Hospital, of arteriosclerosis.

Charles A. Poindexter, Middleport, Ohio; Ohio Medical University, Columbus, 1895; member of the Ohio State Medical Association; aged 68; died, Dec. 11, 1939.

Charles M. E. Watson Ⓢ Lansing, Mich.; Hahnemann Medical College and Hospital, Chicago, 1885; aged 80; died, February 16, of acute cardiac dilatation.

Walter Mendelson, Philadelphia; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1879; aged 82; died, January 18.

Barlow Lloyd Price, Palestine, Ill.; Chicago College of Medicine and Surgery, 1916; member of the Illinois State Medical Society; aged 50; died, January 10.

Richard Deidrich Schmidt, Boston; Tufts College Medical School, Boston, 1904; member of the Massachusetts Medical Society; aged 68; died, Dec. 18, 1939.

Joseph Gerald Hayes, Ridgway, Pa.; Georgetown University School of Medicine, Washington, D. C., 1929; county coroner; aged 33; died, Dec. 16, 1939.

Theophile D. Boulanger, Montreal, Que., Canada; M.B., Laval University Faculty of Medicine, Quebec, 1896, and M.D., in 1898; aged 63; died, Dec. 29, 1939.

Garner Shepard Warren, Decherd, Tenn.; Vanderbilt University School of Medicine, Nashville, 1894; aged 76; died, February 9, of cerebral hemorrhage.

Charles Leroy Lamont, West Frankfort, Ill.; National University of Arts and Sciences Medical Department, St. Louis, 1912; aged 59; died, Dec. 16, 1939.

Richard F. Bigger, Pontiac, Mich.; Medical College of Indiana, Indianapolis, 1887; aged 79; died, January 1, in Carrollton, Ill., of coronary thrombosis.

Charles Francis Crutchlow, Westmount, Que., Canada; University of Bishop College Faculty of Medicine, Montreal, 1904; aged 66; died, Dec. 21, 1939.

Joseph Lane Finley, Grasonville, Md.; University of Maryland School of Medicine, Baltimore, 1884; aged 79; died, February 18, of arteriosclerosis.

Charles Augustus Mitchell, New York; New York Homeopathic Medical College and Hospital, New York, 1896; aged 70; died, Dec. 14, 1939.

Alfred William Pleasants Sr., Lexington, Va.; Leonard Medical School, Raleigh, 1906; aged 62; died, January 31, of carcinoma of the prostate.

George Blackford, Eldorado, Ohio; Pulte Medical College, Cincinnati, 1904; formerly member of the county board of health; aged 58; died, January 28.

James Lue Sutherland, Los Angeles; Rush Medical College, Chicago, 1882; aged 85; died, Dec. 21, 1939, of cerebral thrombosis and arteriosclerosis.

Eli Burton Mayfield, St. Louis; St. Louis College of Physicians and Surgeons, 1886; aged 77; died, February 19, of cerebral hemorrhage.

Adam J. Dauer, Toledo, Ohio; Rush Medical College, Chicago, 1903; aged 64; died, February 24, in the Flower Hospital of coronary thrombosis.

Charles Sandford Neer ☉ Baltimore; College of Physicians and Surgeons, Baltimore, 1893; aged 69; died, January 8, of carcinoma of the liver.

Alvin F. Harrison ☉ Topeka, Kan.; University Medical College of Kansas City, Mo., 1895; aged 73; died, February 24, of coronary occlusion.

Alfred D. Leonard, Middletown, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1878; aged 86; died, January 22.

Patrick C. Donovan, San Jose, Calif.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1879; aged 89; died, Dec. 15, 1939.

Evangeline Brigham Uth, Oakland, Calif.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1886; aged 77; died, Dec. 3, 1939.

Perley Taylor Kierstead, Fredericton, N. B., Canada; Dartmouth Medical School, Hanover, N. H., 1884; aged 80; died, January 15.

John Clark Paris, Kenton, Tenn.; Hospital College of Medicine, Louisville, Ky., 1879; Confederate veteran; aged 88; died, January 31.

John Charles McKinney, Athens, Ga.; University of the South Medical Department, Sewanee, Tenn., 1898; aged 70; died, January 31.

Benjamin H. Dougan, Harvey Station, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1905; died, January 1.

Charles Albert Drummond, Ashcroft, B. C., Canada; Trinity Medical College, Toronto, Ont., 1895; aged 72; died in December 1939.

Andrew Jackson Fitzgerald, North Hollywood, Calif.; Missouri Medical College, St. Louis, 1881; aged 83; died, Dec. 17, 1939.

Robert Lee Cram, Park City, Mont.; Colorado School of Medicine, Boulder, 1906; aged 61; died, January 16, of cerebral hemorrhage.

George Hall Bowles, Plymouth, N. H.; Harvard Medical School, Boston, 1893; formerly bank president; aged 79; died, January 19.

John Benjamin Stallwood, Beamsville, Ont., Canada; University of Toronto Faculty of Medicine, 1904; aged 63; died, January 11.

Arthur W. Furness, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, Que., 1911; aged 59; died, January 14.

Dudley H. Pearson, Clay Brook, Tenn.; University of Tennessee Medical Department, Nashville, 1890; aged 71; died, January 17.

Robert Johnston, Tamworth, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1933; aged 36; died, January 27.

Joseph Wright Miller, Avinger, Texas; Baylor University College of Medicine, Dallas, 1931; aged 36; was burned to death, January 25.

Daniel W. Shelly, Ambler, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1882; aged 79; died, January 16.

Charles Wilburn Miller, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1905; aged 67; died, January 6.

Robert Phinous Frazier, Neptune, Tenn.; University of Nashville (Tenn.) Medical Department, 1908; aged 60; died, January 9.

Ronald Geddes Calder, St. Catharines, Ont., Canada; University of Toronto Faculty of Medicine, 1930; aged 37; died, January 6.

Thomas Brown MacDonald, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1898; aged 71; died, January 5.

George Milne Brodie, Woodstock, Ont., Canada; Victoria University Medical Department, Coburg, 1886; aged 83; died, January 6.

Oscar S. Seidel, Cincinnati; Medical College of Ohio, Cincinnati, 1898; aged 64; died, February 7, of chronic interstitial nephritis.

Arthur Julian Wilson, Plattsmouth, Neb.; John A. Creighton Medical College, Omaha, 1895; aged 79; died, Nov. 10, 1939.

William Walter Scott, New York; University of the City of New York Medical Department, 1895; aged 68; died, Dec. 19, 1939.

Edward I. Hall, Jennings, La.; Rush Medical College, Chicago, 1881; at one time postmaster; aged 89; died, Dec. 3, 1939.

Joseph Aloysius Francis Nall, Philadelphia; Jefferson Medical College of Philadelphia, 1920; aged 49; died, Dec. 3, 1939.

Emil Albert Buchholz, Mount Carmel, Ill.; Kentucky School of Medicine, Louisville, 1899; aged 76; died, Dec. 6, 1939.

George Albert Morrill, Groton, Mass. (licensed in Massachusetts by years of practice); aged 70; died, Dec. 22, 1939.

William Richard Coles, Regina, Sask., Canada; Trinity Medical College, Toronto, Ont., 1901; aged 67; died, Dec. 16, 1939.

John Raper, Bashaw, Alta., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1924; aged 58; died, Dec. 29, 1939.

John T. Jessup, Elwood, Ind.; Indiana Medical College, Indianapolis, 1873; aged 91; died, February 10, of heart disease.

Archibald D. Graham, Bothwell, Ont., Canada; Trinity Medical College, Toronto, 1887; aged 79; died, Dec. 9, 1939.

Michael Charles Burke, High River, Alta., Canada; Manitoba Medical College, Winnipeg, 1915; aged 51; died, January 1.

Jack Hood Reid, Wharton, Texas; University of Texas School of Medicine, Galveston, 1929; aged 35; died in January.

Nicolas Collisi, Alhambra, Calif.; Detroit College of Medicine, 1894; aged 85; died, January 25, of coronary sclerosis.

Willis Washington Hammons, Houston, Texas; Medical College of Alabama, Mobile, 1891; aged 84; died, January 10.

Charles Sumner Diggs, Los Angeles; Meharry Medical College, Nashville, Tenn., 1901; aged 66; died, Dec. 6, 1939.

Alfred L. Deacon, Los Angeles; Kentucky School of Medicine, Louisville, 1885; aged 80; died, Dec. 15, 1939.

James Fleming, Balboa Island, Calif.; Manitoba Medical College, Winnipeg, 1899; aged 71; died, Dec. 30, 1939.

Thomas Creigh Park, Philadelphia; Jefferson Medical College of Philadelphia, 1905; aged 63; died, January 12.

Adrian Benton Perkey, Altadena, Calif.; Rush Medical College, Chicago, 1899; aged 65; died, Dec. 27, 1939.

William Henry Johnson, Turlock, Calif.; Baltimore Medical College, 1904; aged 67; died, Dec. 28, 1939.

Fletcher Lothair Tatom, Lake Worth, Fla.; Atlanta Medical College, 1895; aged 66; died, February 26.

Hedley Vicars Kent, Truro, N. S., Canada; Halifax Medical College, 1890; aged 80; died, January 31.

Samuel Haley, Joy, III.; Northwestern University Medical School, Chicago, 1896; aged 77; died, February 19.

Jacob Levy, Philadelphia; Jefferson Medical College of Philadelphia, 1908; aged 56; died, February 2.

Robert Lee Douglas, Lutts, Tenn. (licensed in Tennessee in 1912); aged 67; died, Dec. 11, 1939.

Correspondence

DELAYED APPEARANCE OF HEART DISEASE AFTER RHEUMATIC FEVER

To the Editor:—An article of interest and practical importance by Drs. Edward F. Bland and T. Duckett Jones "The Delayed Appearance of Heart Disease After Rheumatic Fever," appeared in *THE JOURNAL*, Oct. 7, 1939.

Sir Arthur Newsholme repeatedly expressed the opinion that rheumatic fever does not exist without endocarditis and further stated, as is well known, that clinical recognition of the lesion might be delayed for some time. If my memory serves me, I believe he suggested the name "endocarditis rheumatica" as the most descriptive term for the infection.

Many years ago Sansum, a well known English clinician of his period, called attention to reduplication of the first sound as a precursor of mitral stenosis, a sound which might precede the clinical appreciation of a stenotic lesion by many months.

Approximately thirty years ago I saw a child who had, as is so common, mild evanescent evidences of arthritis, promptly followed by a mitral lesion. He was kept at rest in bed for six months and permitted carefully graded exercise during the following six months. The murmur totally disappeared and there was no subsequent demonstrable evidence of increase in the cardiac area. However, his general health was never good, and though he never manifested another attack of rheumatic fever he remained undernourished and underdeveloped throughout the years.

After the lapse of thirty years, an infection of the upper respiratory tract developed and later a diffuse bronchitis without joint manifestations. Promptly following this infection, he manifested a frank mitral stenosis which has remained in evidence, but which doubtless had existed throughout the years, though it had been only suspected and never proved until the recent infection brought it to light. It is likely, however, that it was a dominant factor militating against his general health and development.

W. E. ROBERTSON, M.D., Philadelphia.

PRESENT STATUS OF THERAPY WITH CHORIONIC GONADOTROPIN

To the Editor:—In the report of the Council on Pharmacy and Chemistry dealing with "The Present Status of Therapy with Chorionic Gonadotropin," which appeared in *THE JOURNAL*, February 10, page 487, the statement was made that "Rubinstein claims that the sperm counts increased following such therapy. His results are statistically unconvincing." Since to the uncritical reader such a statement is interpreted as being synonymous with a misrepresentation of facts, may I take this opportunity to make several additional observations? In my original article (*Endocrinology* 23:75 [July] 1938), which reported studies on six healthy adults, no attempt at statistical analysis was made because it was felt that spermatozoal counts differed so much between the different patients and was so inconstant even in the same patient for similar interval periods that a grouped comparison would hardly be in order. From the data obtained, however, it was concluded that after varying periods of treatment all subjects responded with increased spermatozoal output. This statement was based on the fact that in each patient, after from four to six weeks of treatment, a maximum count was obtained which was greater than the maximum accepted for the control period of observation.

Since this criticism was made, the results have been tested statistically by comparing the maximum sperm counts obtained before, during and after treatment in all cases. It was found that the mean maximum counts in millions for these three periods were 346, 482 and 379 respectively, thus showing an

increase in millions of 136 and 33 for the treatment and after-treatment periods respectively over the pretreatment maximum. Testing these differences by the statistical method of Fisher for small series, it was found that the treatment period increase of 136 gave a t of 3.27, while the post-treatment difference of 33 gave a t of 0.94. When these values of t are compared with those in table IV of Fisher (at 10 degrees of freedom) they are found to give values of P which are less than 0.01 and greater than 0.3 respectively. From this one must conclude that the maximum counts observed during the treatment period were probably significantly greater than the maximum counts observed before treatment. By the same criteria, the maximum counts observed in the post-treatment period were not significantly greater than those noted before treatment began. Statistical analysis therefore corroborates the claim that spermatozoal output was stimulated in these normal men as the result of treatment. This, however, does not imply that the hormone can be used to treat azoospermia or oligospermia. From the study as originally published, it just means that the hormone in the dosage used stimulated spermatozoal output in the normal male. It is somewhat confusing that the reviewer was willing to disregard the reports of Brosius and Schaefer, Heckel and Rubinstein regarding the increased spermatozoal output and yet quoted as final the report of McCahey, who in his paper (*Pennsylvania M. J.* 41:359 [Feb.] 1938) gave details regarding only two cases. At the end of his paper McCahey makes the note "Since this paper was written, I have had a successful result in a case of necro-spermia. The patient was age 35, and the basal metabolic rate was minus 2. Two cc. of antuitrin-S were injected biweekly and at the end of fifteen weeks the specimens contained numerous active spermatozoa." Reviews such as these almost force one to the conclusion that the reviewer is unduly swayed by prejudice.

It appears that many discrepancies in reports dealing with the effects of endocrine products arise from the differences in dosage employed by the different investigators. Thus, the same hormone (e. g. testosterone propionate) used under similar laboratory or clinical conditions may show stimulating or depressing effects depending on the dosage used. It is a common error for clinicians who observe mild stimulating effects with a certain dosage of hormone to increase the amount administered rapidly in order to magnify the desired effect. Much to their chagrin they are disappointed and, forgetting the initial gratifying result obtained with the smaller dose, conclude that the hormone was useless.

In the attempt to orient ourselves properly to the rapidly moving events in the field of endocrinology, not only is it necessary that clinicians and investigators observe critically and report without undue claims their respective observations, but it is even more important that reviewers analyze material carefully so that medicine in general may profit to the utmost from the labors of all conscientious researchers.

H. S. RUBINSTEIN, M.D., Baltimore.

COMMENT.—The following is a reprint of the paragraph under discussion:

SPERMATOGENESIS

Several investigators have reported the use of chorionic gonadotropin in sterility. Their studies are rather incomplete. Brosius and Schaefer have reported the induction of spermatogenesis with such therapy in a case of azoospermia. Heckel has treated eight sterile males with this substance, after which the wives of two became pregnant. Rubinstein claims that the sperm counts increased following such therapy. His results are statistically unconvincing. On the other hand, McCahey was unable to demonstrate any increase in the sperm count after injection of chorionic gonadotropin. Many other urologists have been disappointed in its use in sterility. The physiologic response of this substance in experimental animals would not lead one to anticipate much of an effect on spermatogenesis, since it is well known that this substance influences chiefly the interstitial cells and has little if any effect on the germinal epithelium. It is therefore apparent that deficient sperm formation is a doubtful indication for such therapy on both clinical and experimental evidence.

It does not appear that this paragraph portrays any prejudice on the part of the reviewer, nor has he disregarded the work:

of Brosius and Schaefer and of Heckel, nor does he stress the work of McCahey, whose results are not in agreement with those of the aforementioned workers.

The object of the original report was, of course, to evaluate the results in the literature in an effort to prevent the widespread use of endocrine preparations for indications which had not been established on a sound basis or as a result of adequate clinical data. The reviewer does not believe that the literature contains sufficient evidence to recommend the use of chorionic gonadotropin for the induction of spermatogenesis, and this belief is apparently shared by Dr. Rubinstein himself.—Ed.

"EFFECT OF SULFONAMIDE DERIVATIVES ON AIRPLANE PILOTS"

To the Editor:—In connection with the article "The Effect of Sulfonamide Derivatives on Airplane Pilots" appearing on page 1237 of the Sept. 23, 1939, issue of THE JOURNAL, the Medical Section of the Civil Aeronautics Authority has the record of an airplane accident regarded by it as being due to the effects of sulfanilamide ingested by the pilot. It is believed that this may have been the contributing factor in other accidents and that aircraft pilots are not sufficiently familiar with the possible effects of this and similar drugs.

Presumably, physicians prescribing sulfanilamide and related drugs are aware of such effects and caution patients whom they know to be aircraft pilots regarding the danger of piloting while using these drugs, yet many persons flying only for pleasure may seek medical advice without informing the physician of their piloting activity. Also these drugs are used for self medication without being prescribed by a physician.

In the belief that wider publicity regarding the effects of sulfanilamide on the nervous system will tend to prevent accidents attributable to this cause, it is requested that publicity be given this subject in THE JOURNAL, advising physicians of the importance of cautioning their patients against piloting aircraft or engaging in similar activities during or a few days after taking sulfanilamide, sulfapyridine or similar drugs.

ELDRIDGE ADAMS, M.D., Washington, D. C.
Chief, Medical Section, Civil Aeronautics Authority.

THE USE OF SULFANILAMIDE AS PROPHYLAXIS FOR SCARLET FEVER

To the Editor:—A recent local epidemic of scarlet fever followed by a number of endemic cases has given an opportunity for a study of the use of sulfanilamide as prophylaxis to children exposed to scarlet fever. At first it was used only in cases in which the cost of the scarlet fever antitoxin was prohibitive or it was feared that some reaction might attend the use of the antitoxin. Later, when it was seen that the use was successful in the prevention of the disease, it was used in all cases of exposure. To date in only one person of 116 exposed has scarlet fever developed after the use of sulfanilamide, and in this one exception the person had been exposed five days previously and the fever developed the day following the start of the drug.

Perhaps the most spectacular instances and the two that started the use of the drug in this capacity occurred in two families seen on the same day, living in separate homes but almost in the same yard. Both families were on relief, both were living in two or three room houses and both had large families of young children. Here the cost of antitoxin was prohibitive and, as both families certainly needed prophylaxis of some nature, in desperation sulfanilamide was used. The course of disease in the two families is given in the following report:

FAMILY 1.—Albert B., aged 13 years, seen in September 1938, presented a typical textbook picture of scarlet fever, with strawberry tongue, sore throat, pinpoint rash over the body and a

history of fever for three days, headache and vomiting. There were three other children aged 9, 11 and 15, all living in the same house of three rooms, in almost constant contact. The three exposed children were given 5 grains (0.3 Gm.) three times a day for five days. None of them contracted scarlet fever, but fourteen months later, within a day apart, all three contracted the disease. At this later date an epidemic was present but the source of contact was not determined.

FAMILY 2.—In September 1938 on the same day on which Albert B. was seen Roy H. aged 12 years was seen and a tentative diagnosis of scarlet fever was made. The symptoms were not definite, but the boy had a fever of 101 F. and a sore throat but only a slight blush over the body. There were eight other children in this family ranging in age from 6 to 17 years. Sulfanilamide was prescribed but owing to the mother's belief that the child did not have scarlet fever she did not give the sulfanilamide. Within fourteen days, all except the 17 year old girl had scarlet fever.

The tabulation shows the results of sulfanilamide prophylaxis in a number of the cases of exposure. The dosage used was 5 grains three times a day.

Patient	Exposed Child	Age, Years	Incubation Days	Result
Berniece	Everitt.....	10	3	No fever
Bernard	Allee	7	4	No fever
	Paul.....	10	4	No fever
	Ruth.....	12	4	No fever
	Meilyn.....	21	4	No fever
	Albert.....	18	4	No fever
Fred	John	6	5	Slight rash and fever next day; very mild

The cases included in the tabulation are typical of the many observed during the past two years and in addition to these a complete record of ten patients with scarlet fever exposing in their families twenty-six children of various ages and with doses of sulfanilamide from 2 grains (0.13 Gm.) in 3 and 4 year old children to 5 grains every three hours in adults, no cases of scarlet fever have developed. From this it seems that for an average weight of 75 pounds (34 Kg.) a dose of 5 grains three times a day is sufficient to prevent scarlet fever and should be given for four or five days after exposure.

In none of these cases were any controls used, nor did it seem advisable, since an epidemic was present and it has long been established that the disease is contagious.

It is realized that what is reported here is just a beginning, but there can be no question that sulfanilamide has a place as a prophylactic drug, as well as one to be used in the treatment of diseases.

L. E. JEWELL, M.D., Meridian, Idaho.

STOMACH LAVAGE IN THE DIAGNOSIS OF TUBERCULOSIS

To the Editor:—The publication of "Stomach Lavage in the Diagnosis of . . . Tuberculosis" by Stadnichenko, Cohen and Sweany in the February 24 issue of THE JOURNAL reminds me again that workers in the field of tuberculosis seem to be oblivious of the earliest American work on the diagnosis of pulmonary tuberculosis by recovery of tubercle bacilli from the stomach contents.

In the recent article it is erroneously stated that in 1931 Vilhelm Clausen had the distinction of being the first to report results in adults. All recent writers seem to be unaware of the fact that sixteen years before that date a paper entitled "Tubercle Bacilli in Stomach Contents" appeared in the *Archives of Diagnosis* (8:154 [April] 1915), a journal now defunct. The senior author, Prof. I. H. Levy, of Syracuse, N. Y., is entitled to full credit for the idea. I was his assistant at the time and did the "mopping up."

JOHN L. KANTOP, M.D., New York

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

THE "SAFE PERIOD"

To the Editor:—Will you please advise me what, in the light of present knowledge, is the likelihood of a woman with a twenty-seven to forty-five day menstrual cycle becoming pregnant from intercourse limited to the time during the menstrual period and the three or four days immediately following the period? I am thinking of the suggested possibility of extracyclic additional ovulation induced by intercourse. In the case in question a limited experience has indicated that this may be a sterile period.

M.D., Massachusetts.

To the Editor:—I am writing you concerning information asked of me by a patient with regard to the application of "the safe period of contraception." The patient's menstrual time varies from thirty to thirty-six days. Would it be possible for her to place any reliance on this method and if so what date should be avoided?

M.D., California.

ANSWER.—While the question of the reliability or unreliability of the "safe period" has been discussed for many years, its exact status is not yet fully clarified. In monkeys the reproductive phenomena are nearly identical with those in human beings and there is an opportunity for studying the question in an objective way. Investigations in women, however, have always been obscured by such subjective elements as the unreliability of menstrual dates and of dates of coitus. The value of many of the clinical reports with which the literature abounds is limited because of the uncritical attitude on these factors.

The first query poses two questions on which no clearcut evidence is available. The theoretical possibility of ovulation during menstruation is admitted even by laboratory investigators (Hartman) and a few clinical reports suggesting this possibility have been made, but Hartman states that in monkeys ovulation has never been observed before the eighth day or after the twenty-first day of the cycle.

The question of whether coitus may in man, as in such animals as the rabbit, be a determiner of ovulation has been discussed for many years, but no worthwhile evidence is available to substantiate this theory. Even if such coitus-induced ovulation took place, it would seem unlikely that it would be an "additional ovulation," i. e. that two separate ovulations would occur during the particular cycle.

To summarize the answer to the first query, therefore, it may be stated that coitus during the menstrual period and during the three or four days immediately following would be reasonably if not absolutely safe.

The second query necessitates a consideration of the whole fundamental concept of a "safe period" and of the evidence on which this is based. Only a few salient points can be referred to here. For fuller, though unfortunately sometimes unilateral, discussions the reader may be referred to the monographs of Ogino, Knaus and Latz. Among many articles reporting studies which cast doubt on the value of the method reference may be made to:

Bolaffio, Michele: Die periodische Frucht- und Unfruchtbarkeit des Weibes, *Zentralbl. f. Gynäk.* 57: 2606 (Nov. 4) 1933.

Wittenbeck, Franz: Ovulationstermin und Konzeptionsfähigkeit bei der Frau, *Arch. f. Gynäk.* 142: 446 (Sept.) 1930.

Stein, I. F.: Contraceptive Methods, *THE JOURNAL*, April 8, 1939, p. 1311.

An excellent review, written from the standpoint of the laboratory scientist, is to be found in the monograph by Carl G. Hartman "Time of Ovulation in Women" (Baltimore, Williams & Wilkins Company, 1936).

The present status of the question can be fairly summarized as follows: There is general agreement that in women who menstruate normally in cycles of approximately twenty-eight days (from twenty-six to thirty-two) ovulation probably rarely occurs before the eighth or after the twentieth day, that the ovum after being given remains fertilizable for not over twenty-four hours, and that the spermatozoon is incapable of fertilization for longer than about thirty hours after insemination. The evidence on this last point is based largely on animal studies and seems less convincing than that pertaining to the ovum.

There is, however, much uncertainty as to what happens in unusually long or unusually short cycles. Most authorities have felt that the corpus luteum phase is a fairly fixed one.

of about two weeks (Hartman), while Schröder and others believe that in short cycles it is the corpus luteum phase which is short. This has an obviously fundamental bearing on the safe period doctrine, and the point is still unsettled. Add to this the notorious unreliability of menstrual dates, the variability of the intervals even in women who consider themselves regular, the possibility that ovulation may occasionally occur unusually early or unusually late, that it may possibly be precipitated by coitus, and many other moot points, and the relative uncertainty of the biologic method of contraception in many women can be readily understood. In such cases as that described in the second query, the proper advice would be that limiting intercourse to the week before an expected date gives much protection, and in this patient this would mean twenty-three days after the day of the preceding menstrual onset. To this might be added the suggestion that the few days immediately following menstruation should carry no great risk. Too much stress cannot be placed on the importance of keeping accurate menstrual dates for at least a year before beginning the method, when this is feasible. The question has many other ramifications, which cannot be discussed in this short space.

In fine, it may be said that in women with reasonable normal menstrual cycles of from twenty-six to thirty-two days the method is of much value, though almost certainly far from infallible. In women with irregular periods its value is definitely less.

TREATMENTS OF AND SURGICAL PROCEDURES IN HEMOPHILIA

To the Editor:—Kindly discuss the effectiveness of newer procedures other than transfusions in the lowering of clotting time in hemophilia. Within the last two years or so, several articles and abstracts have appeared in *The Journal* concerning the effectiveness of the following in lowering or shortening the clotting time in hemophilia: (a) Female sex hormone; theelin and corpus luteum. (b) Extract from egg white; also a potassium bromide and egg white mixture. (c) Histidine. (d) Vitamin K. (e) Snake venom. (f) Thromboplastin. Is there any contraindication to the treatment of varicosities in hemophilia, hemorrhoids and varicose veins of the legs with the injection of sclerosing solutions?

Eugene J. Boros, M.D., Bethany, Ill.

ANSWER.—There is at present no specific therapy for hemophilia, for the exact nature of the defect in the blood clotting mechanism of hemophilic blood is still unknown. Blood transfusion is still the only certain method for reducing the clotting time. However, recent research by Patek, Pohle and Taylor (*J. Clin. Investigation* 16:113 [Jan.], 741 [Sept.] 1937), Bendien and van Creveld (*Am. J. Dis. Child.* 54:713 [Oct.] 1937) and Howell (*Bull. New York Acad. Med.* 15:3 [Jan.] 1939) has pointed to the existence in normal blood of an unknown substance which hastens the clotting process but which is lacking in hemophilic blood. This has been named by the respective authors "globulin substance," "coagulation globulin" and "plasma thromboplastin." Intravenous injection of an extract of blood containing this factor has successfully lowered the clotting time of hemophilic patients to normal or toward normal for several hours or days. Howell states that the future for successful therapy of hemophilia lies in the isolation and purification of a globulin substance or thromboplastin which can be used safely for blood transfusion. None of the other substances mentioned in this query have yielded consistently good results when tried by others.

(a) Female sex hormone and ovarian extracts were advocated by Birch (*THE JOURNAL*, Nov. 5, 1932, p. 1566) and recently by Kocsis and Hassko (*Deutsche med. Wchschr.* 64:1284 [Sept. 2] 1938) on the assumption that there is an endocrine basis in this disease, since it occurs only in males. However, the good results reported by them could not be corroborated by other investigators (Stetson, R. P.; Forkner, C. E.; Chew, W. B., and Rich, M. L.: *THE JOURNAL*, April 7, 1934, p. 1122) and Howell.

(b) The report of Timperley, Naish and Clark (*Lancet* 2:1142 [Nov. 14] 1936) on the use of an extract prepared from egg white treated with potassium bromide has already been discussed in *THE JOURNAL* (Nov. 19, 1938, p. 1953). Confirmation of their successful results is as yet not available.

(c) Kohl (*Ztschr. f. klin. Med.* 132:40 [No. 1] 1937) claimed a successful result with histidine, but Bloch and Necheles (*THE JOURNAL*, July 17, 1937, p. 204) failed to demonstrate any effect of histidine on blood clotting.

(d) Vitamin K has had no effect in reducing the clotting time or the bleeding tendency in hemophilia. This is as one would expect, since no deficiency in prothrombin or vitamin K has been demonstrated in this disease (Dam and Glovind, *Lancet* 1:720 [March 26] 1938).

(e) The parenteral administration of moccasin snake venom is not advocated in hemophilia. This venom fails to facilitate

blood clotting but acts directly on vessel walls. However, the local application of the diluted venoms of *Bothrops atrox* (Peck, S. M.; Crimmins, M. L., and Erf, L. A.: *Proc. Soc. Exper. Biol. & Med.* 32:1525 [June] 1935), tiger snake (Rosenfeld, Samuel, and Lenke, S. E.: *Ann. J. M. Sc.* 190:779 [Dec.] 1935) and Russel viper (MacFarlane, R. G., and Barnett, Burgess: *Lancet* 2:985 [Nov. 3] 1934) has been found efficacious in producing blood coagulation and in arresting external hemorrhage from the skin, gums and nose and after dental extractions.

(f) The effect of the parenteral administration of plasma thromboplastic substance has been discussed. More experience is needed to determine whether it can actually replace blood transfusion. The local application of tissue thromboplastin has also been found of value in uncontrollable external hemorrhage. Howell claims that a glycerin extract of dried lung is the most potent preparation for this purpose.

In answer to the last question, it is generally agreed that elective surgical procedures should not be undertaken in hemophilia, for an otherwise harmless procedure may lead to uncontrollable hemorrhage. However, if varicosities of the leg produce serious discomfort or disability not alleviated by elastic supports or bandages, injections of a sclerosing solution may be attempted. Venipuncture in hemophilia results in uncontrollable bleeding in only rare instances. Particular care should be taken not to produce a superficial slough which may bleed easily, to collapse the vein by gravity before injecting into it, and to approximate immediately the sclerosed surfaces by direct pressure. Similar considerations apply to hemorrhoids. Conservative measures, such as diet, liquid petrolatum and suppositories, should be tried first. If the hemorrhoids bleed excessively, injections should be attempted, great care being taken not to produce a slough of the mucous membrane.

APHAKIA

To the Editor:—Is there a table showing the percentage of visual loss following a cataract extraction? For instance, a visual acuity in a non-aphakic eye of 20/25, according to my chart, would be 95.6 per cent. In an aphakic eye when the other eye is normal it is practically impossible to wear a correcting lens without having a diplopia. For all practical purposes, then, an aphakic eye even though it should have a visual acuity of 20/25 would still be of little use to the patient, as he would not have single binocular vision. This, then, would leave the patient with a much greater disability than the same percentage of vision in an eye without a cataract extraction. I am caring for a patient for the Oregon state industrial accident commission who developed a cataract following an injury to one eye. I removed the cataract, and with glasses he now has a visual acuity in this eye of 20/25. He also has a round pupil. The commission has asked me to report the industrial amount of visual loss for this man, but I have been unable to find any table for loss in an aphakic eye. The vision in the other eye is normal. I would greatly appreciate any information you can give me regarding this.

Frank L. Ralston, M.D., La Grande, Ore.

ANSWER:—The inquirer may be referred to the report on "Appraisal of Loss of Visual Efficiency—Standard Method Approved by the House of Delegates of the American Medical Association, May 26, 1925." On page 4 of that report is the following paragraph:

If there exists a difference of more than 4 diopters of spherical correction between the two eyes, the best possible vision of the injured eye without glasses or with lenses of not more than 4 diopters spherical difference from the fellow eye shall be the acuity on which subsequent rating is to be computed for this injured eye.

The committee that compiled the report recognized the image size difference that exists between a normal eye and an aphakic eye with correction. It was realized that the resultant loss of the simultaneous use of the two eyes necessitated compensation and the paragraph quoted was believed to be the fairest means of attaining that end.

CENTRAL CHORIORETINITIS AND STREPTOCOCCIC INFECTION

To the Editor:—Please advise as to the possibility of a central chorioretinitis, both eyes, being caused by a streptococcal infection. In the case under consideration a man aged 62 had a hemolytic streptococcus infection in 1932 and has experienced gradual loss of vision since that time. All laboratory examinations were negative.

Grover C. Sweet, M.D., Noroton Heights, Conn.

ANSWER:—A central chorioretinitis due to streptococcal infection must be a great rarity although it is theoretically possible; however, in a man of 62 with such an undermining condition various secondary causes must be thought of. A moderate degree of arteriosclerosis, existing before such an infection, may be so disturbed that nutrition of the central macular area with degeneration of the visual cells is quite likely. Other conditions to be considered are glaucoma, toxic amblyopia such as alcohol, and tobacco poisoning and allergic states. With recovery from the streptococcal infection it would seem unlikely that gradual loss of vision since 1932 could be attributed to such a source.

MOTILE CELLS IN URINE SPECIMENS

To the Editor:—Frequently I find motile cells in urine specimens. These are slightly larger than leukocytes and are either oval or round. The oval cells are flat and move either by turning over and over or by spinning. The round cells move in a straight line and the means of locomotion is not visible. Heat destroys motility. I can find no information concerning these motile cells and would appreciate any you may have on the subject.

E. C. Hanisch, M.D., St. Paul, Neb.

ANSWER:—It is difficult to state just what these motile cells might be. It seems reasonable to assume that they are most likely *Trichomonas vaginalis* organisms, as they have frequently been noted in the urine of patients both male and female. It is also of interest to note that they may be found at times without any local symptoms.

RESISTANT HAND INFECTION

To the Editor:—Can you give me some assistance in the matter of etiology and treatment of a case involving the fascia and tendons of the hand resulting from an injury? About two years ago a man of Spanish blood, born in Chicago and aged 53, had the right index finger badly mangled between two lengths of pipe while employed by the road commission. The contract surgeon dressed the finger, which became infected and after a period of two or three weeks was amputated at the second phalangeal joint. The wound refused to heal and after x-ray examination and treatment was subjected to a second amputation at the middle of the proximal phalanx by still another surgeon. This wound too refused to heal and though repeated x-ray examinations reveal no bone involvement, sinuses continued to recur and heal about the end of the stump. Great tenderness exists in the stump and various nodules the size of a bean have developed along the tendons of the palm and wrist, up to a point above the annular ligament. These too are tender, and contractures of the palmar tendons of the index, second and fifth fingers have developed. The patient has been under the care of a number of excellent surgeons and has had extensive blood examinations and cultures. Repeated Wassermann tests have been negative, as also are blood cultures and smears and cultures from the sinuses of the stump. Sulfanilamide proves unavailing, as does all other medication that has been tried. Any suggestions or assistance that you can give me will be greatly appreciated.

M.D., Utah.

ANSWER:—The patient may be suffering from some unusual type of infection, such as one of the sporotrichum group, or from an anaerobic streptococcus infection. If cultures of the wound discharge made under anaerobic conditions do not reveal the cause of the trouble, special cultures on suitable mediums should be carried out.

The symptoms, and particularly the appearance of nodular enlargements proximal to the site of primary infection, suggest the possibility of infection due either to a sporotrichum, to some other form of fungus, or to organisms of the *Actinomyces* group.

F. L. Meleney, of New York, has written extensively of the infections due to the anaerobic streptococcus and their symptomatology, course and treatment.

TIME OF OPERATION IN CHOLECYSTITIS

To the Editor:—Is it good surgery to remove an acute empyema of the gallbladder? A city surgeon has "bagged me," so to speak. A woman of 52 with blood pressure ranging from 140 to 220 systolic and from 90 to 100 diastolic entered and had the gallbladder drained. Three and a half months later another surgeon, after doing the cholecystectomy, advised the family that the first man should have done the whole job originally. Who is right? I am in the middle.

M.D., Connecticut.

ANSWER:—The question as to when to operate in gallbladder disease is one concerning which there is a good deal of debate at the present time. The sequence of events in acute cholecystitis is commonly as follows: A stone becomes impacted in the cystic duct or in the ampulla, the gallbladder is obstructed, and the continued secretion of mucus by the gallbladder mucosa distends the viscus to the point of interference with its blood supply, leading to swelling and edema of the wall, local areas of necrosis or gangrene and in some cases to perforation. Infection is a minor factor since the imprisoned bile contains few or no organisms, the situation thus differing from that in the case of the appendix. Operation may be done immediately, an opinion voiced by an increasing number of surgeons, and the gallbladder can be removed without undue hazard from infection. It is thus good surgery "to remove an acute empyema of the gallbladder." On the other hand, the great distention of the gallbladder and especially the swelling and hyperemia of the wall and the loose areolar tissue about the cystic and common bile duct may well justify cholecystostomy as involving less risk of injury to the common duct. The general condition of the patient and particularly the behavior toward the anesthetic are factors which also must be taken into account. The second surgeon had no right to "advise the family that the first man should have done the whole job originally."

CONVULSIONS IN INFANCY

To the Editor:—A patient 2½ years of age has had, according to the mother, about four spells daily since 1 year of age consisting of momentary facial pallor, bending over but no loss of balance and occasional left arm rigidity, followed by twitching and lateral deviation of the right eye. There is no loss of consciousness or loss of vesical or rectal contents. I had occasion to observe the patient during an attack in the office which lasted about a half minute in its entirety. It was as described except that the patient lapsed into deep sleep after the attack. The patient was delivered normally at nine months. Physical examination showed no abnormality. The reflexes were all apparently normal. There is no history of birth injury or epilepsy in the family. Since the attacks resembled those of petit mal, the patient has been treated with sedation and a high caloric, high vitamin diet, with no apparent benefit to date. What would you consider in the differential diagnosis? What prognosis could be offered at this time? What would be the best line of treatment to follow?

M.D., Michigan.

ANSWER:—Major, minor or jacksonian seizures occur frequently in children and usually have no localizing value even though a brain tumor or brain abscess may be present. The description of the attack in this case is that of a major seizure with motor auras, that is, twitching and lateral deviation of the right eye with an occasional left arm rigidity. This points to a lesion either in the premotor or motor area of the right side of the brain or in the pontile region. The patient should have a complete neurologic examination and either ventriculographic or encephalographic study for the purpose of ruling out a surgical lesion of the brain. If no such lesion is found, the patient has epilepsy of undetermined origin and should be observed. Sodium bromide or phenobarbital might be helpful.

SENSITIZATION TO TATTOOING PIGMENT

To the Editor:—A man aged 22 was tattooed on the left arm two years ago. Six months ago he was tattooed a second time, in New York. After the operation the mark went through the usual period of healing and no more trouble was experienced. Now, two weeks ago, he subjected himself to a third session of tattooing—this time on the right arm. Two days after this operation a curious phenomenon occurred. All the areas in which red dye was incorporated by the needle became swollen, irritated and itchy. This was noticed not only in the operation of two weeks ago but also in those done two years and six months ago. The man has no general body eruption but he has a painful inguinal adenitis. I have seen him only today and will not see him again as he leaves for abroad tomorrow. Why should this patient suffer, what I believe to be, an acute dermatitis in areas of the skin stained red following his latest tattooing?

William J. MacDonald, M.D., Boston.

ANSWER:—This phenomenon is a fine example of sensitization occurring after two years of exposure to a red pigment. During that time no general sensitization took place; but the third deposit of the dye resulted in the formation and liberation of antibodies specific for this substance. The consequence was the irritation of the tissues about the red deposits, swelling and nerve stimulation. All the elements of sensitization are demonstrated, incubation period, reaction at the point of latest inoculation and simultaneous reaction about all other deposits of the same dye. This may be cinnabar, a sulfide of mercury also known as vermilion, commonly used as the red pigment in tattooing.

FRUIT JUICES AND ALKALIZATION

To the Editor:—Please explain why fruit juices which are acid act as an alkali in the stomach. A patient of mine, who is a chemist, claims that this acid must unite with calcium in bones to give an alkaline reaction.

M.D., Rhode Island.

ANSWER:—Fruit juices do not act as an alkali in the stomach. Their acidity is due to organic acids which form salts on reaching the alkaline medium of the small intestine. When these salts of the organic acids are absorbed the acid radicals are metabolized, leaving the alkaline ions free. Thus fruit juices, while acid in reaction, are "alkaline ash" producing foods. There are exceptions such as prunes and cranberries, which are "acid ash" foods because they give rise to hippuric acid as one of their end products.

However, even if the diet is of preponderantly "acid ash" nature, it does not follow that calcium need be liberated from the bones for purposes of neutralization. The body has several mechanisms to deal with the ordinary excesses of acid catabolites. Chief of these is the ability of the kidney to excrete a highly acid urine. This organ can also produce ammonia with which to neutralize acids before excretion. It is only when the compensating mechanisms of the body are overcome, by extreme or prolonged acid intake or by pathologic acid formation in the body, that it becomes necessary to draw on the calcium, sodium and potassium of the bones to replenish the alkali reserve of the blood.

MANDELIC ACID AND EPILEPSY

To the Editor:—Has mandelic acid ever been successfully used as a substitute for the ketogenic diet in the treatment of epilepsy?

M.D., Ontario.

ANSWER:—Mandelic acid has been used as a substitute for the ketogenic diet in an attempt to produce a similar effect. While no reports have been published, mandelic acid has been tried and found to have no effect on the convulsions of epilepsy. It is well known that mandelic acid is excreted unchanged in the urine. It is not conjugated or metabolized, therefore it does not produce the ketosis or beta-hydroxybutyric acid which is the aim of the ketogenic diet. Peterman demonstrated that acidification produced with ammonium chloride or with an organic acid carbon atom fat had no effect on the seizures of epilepsy. After Cook had shown the bactericidal effect of the urine of some patients on the ketogenic diet, Rosenheim found an organic acid (mandelic) which was excreted intact and gave the urine bactericidal properties. However, this acid does not produce a ketosis or ketonuria, which seems to be essential to produce results in the treatment of epilepsy.

WHOOPIING COUGH VACCINATION—CARRIERS
NOT RECOGNIZED

To the Editor:—After immunization with Sauer's vaccine in the recommended dosage, can a child contract a subclinical case of pertussis and so be a carrier of that disease?

Edward B. Mates, M.D., Salem, N. Y.

ANSWER:—After inoculation with Sauer's vaccine according to the recommended dosage, it is believed usually that a period of four months must elapse before immunity is established. Consequently, if the inoculated child was exposed to whooping cough before the lapse of four months, protection would not be assured. It is also possible that, after a period of four months from the time inoculations were completed, some children might develop whooping cough in a modified form. The disease could also occur without the characteristic whoop and yet be contagious. Generally the existence of pertussis carriers is not acknowledged. As a rule the organism responsible for whooping cough is seldom transmitted from a patient to a susceptible individual for a period of more than two weeks following the onset of the paroxysmal stage.

OILY VEHICLES FOR NASAL SPRAYS

To the Editor:—With regard to lipid pneumonia I have a compressor vapor spray outfit in which the oil is formed into a fine nebula and inhaled, filling the lungs. Liquid petrolatum is now used as a base for the spray. I am going to change to a vegetable oil and was thinking of using cottonseed oil. Would that be acceptable?

M.D., Oklahoma.

ANSWER:—If an oil is to be used as a base for a nasal spray, a vegetable oil is certainly preferable to mineral oil. There is now abundant evidence that mineral oil in the lungs acts as a foreign body, causing interstitial fibrosis and giant cell formation. There are several instances on record in which the fibrosis has been so severe as to warrant the use of the term paraffinoma of the lung. On the other hand, Pinkerton and others have shown that vegetable oils can be metabolized by tissue enzymes and for that reason do not act as foreign body irritants. Cottonseed oil might be used, although the fact should be borne in mind that a good many patients are sensitive to this oil. One wonders why an oily spray is necessary at all, since all the vasodilators and so-called antiseptics can be dissolved in salt or dextrose solutions. There is no evidence that substances dissolved in these fluids cause any harm to the respiratory tissues, and their use would seem to be a more physiologic type of therapy than that in which foreign oily material is introduced intentionally into the respiratory tract.

REMOVAL OF MERTHIOLATE STAINS

To the Editor:—Following is a formula for the removal of tincture of mercuric iodine stains:

Hydrochloric acid (concentrated).....	2%
95% alcohol.....	as much as will suffice
or	
Hydrochloric acid (concentrated).....	10 cc.
95% alcohol.....	sufficient to make 500 cc.

To remove the stain moisten a piece of gauze with the solution and rub the stained tissues with a fair amount of pressure. This will remove most or all of the stain.

Myron Metzbaum, M.D., Cleveland.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

*Thirty-Sixth Annual Meeting, held in Chicago, Feb. 12 and 13, 1940
(Continued from page 1401)*

DR. FRED MOORE, Des Moines, Iowa, in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 13—MORNING

Cancer in the Medical Curriculum

DR. LUDVIG HEKTOEN, Washington, D. C.: What should the medical student know about the cancerous diseases when he completes his course? He should have a good idea of their significance as social and medical problems. The importance of early diagnosis and prompt treatment of cancer should be so deeply stamped on his conscience that henceforth he will act under an acute sense of the gravity of his responsibility as to cancer. He should understand that accessible cancer is curable in the early local stages while practically 100 per cent fatal in the disseminated forms, and that the advance from the favorable to the unfavorable stage may take place within a very short and uncontrollable space of time; also that today cancer is not a one man job. The diagnosis and treatment require cooperatively organized and well equipped services; consequently the physician who is not specially trained in that field is in duty bound to refer his cancer cases and suspected cancer cases without delay to physicians who have the needed skill, experience and facilities. He must sense at once the need of consultation with respect to cancer. He should have enough understanding of the fundamentals of roentgenology and of radium therapy to know that, like surgery, these agents are safely effective only in the hands of those who are skilled in their use under different conditions.

When the student leaves medical school he should definitely realize also the responsibilities that rest on him with respect to the prevention of cancer. Is the prevention of cancer receiving adequate attention in the medical curriculum?

The oncoming physician should be well informed about current activities toward cancer control. It is essential that he understand the nature and scope of the organized efforts by private, state and federal agencies, now spreading into communities everywhere, toward the better control of cancer by education of the public, by instruction of doctors, by legislation, by the provision of treatment centers, by research. That we are in the midst of a determined effort to advance the control of cancer is of immediate concern to every physician. It is important that the coming physician be prepared for an intelligent part in the general anticancer program. He should be informed about the nature and significance of the steadily growing movements of our time toward specialized clinical cancer service and the establishment of the cancer institutes and clinics. He will be concerned in the accessibility for his community of reliable centers for the diagnosis and treatment of cancer as well as in the increase of approved cancer clinics in general hospitals. And he will not lose sight of his responsibility in the medical and social follow-up of his cancer patients at intervals during their lifetime.

Cancer occupies many places in the curriculum. The basic teaching as to its nature and structure is given in the department of pathology. The manifestations, diagnosis and treatment of cancer receive attention in every clinical branch. As yet cancer as a social and public health problem does not receive proper consideration in the medical course. The teaching of cancer in medical schools needs better organization to give the students a broader, more realistic conception of cancer and of the present methods of the diagnosis and treatment of its various

localizations, forms and stages. This statement applies also to hospitals approved for internships. There can be no question that hospitals with approved cancer clinics should be preferred for general internships.

Different plans have been suggested to advance the teaching of cancer to students. It has been proposed to establish a department or chair of oncology. Another plan is to place the teaching under one competent head, who is to be given general control of enough material for a systematic course of instruction. In the meantime, pending future developments the teaching of cancer should be advanced by better correlation of the agencies concerned. In such advance the cancer clinic in the general hospital will play a most important part. The cancer clinic has been developed to provide equipment and organized cooperation in clinical work. Here diagnosis, treatment and follow-up study are carried on under the guidance of specialists in diagnosis and pathology, surgery with its subdivisions and radiology. Pathologic and clinical conferences, group or combined clinics as a rule cannot meet the needs of the medical student as fully as the permanent, well organized cancer clinic.

Some Criteria on the Selection of Medical Students

DR. IRVING S. CUTTER, Chicago: This article appeared in full in *THE JOURNAL*, March 23, page 1123.

The Recognition of Professional Aims in the Teaching of the Fundamental Medical Sciences

DR. M. B. VISSCHER, Minneapolis: All educational enterprises and practices fundamentally are, and must be, compromises between the two conflicting ideals of perfect training and of reasonably short periods of training. The pattern for medical education in America was cut in the late nineteenth century after the European model, largely the German one. It has been modified since, but it has never been gone over completely in the light of the changed character of medical science itself and the changing trends of medical practice. There are many reasons why medical schools have not fundamentally altered their pattern of teaching. The new is dangerous. Changes in emphasis mean shifts in the relative importance of one or another branch. The vested interests of a guild often prevent progressive change. In education the traditional independence of the departmental units is often a bar to alterations. The assumption that specialists in a given branch are the most competent to know the relative importance of that division of knowledge in the training of professional students is dangerous.

In the prevailing pattern of medical education today in the preclinical sciences, the morphologic sciences receive much more attention than do the functional ones. There would be no point in stating this fact if it were not for the observation that there is widespread dissatisfaction with physiologic teaching in medical schools. The prevailing sentiment is that from the physician's standpoint the physiologic sciences are not properly handled in the medical curriculum. This dissatisfaction results mainly from one cause—the increasing importance of physiologic information to the diagnosis and treatment of disease. This change in the character of the physician's thinking about disease is perhaps the most significant alteration in medicine in the past half century. It has had repercussions on the character of medical education. The dynamic aspects of disease cannot be given emphasis unless anatomy becomes, or at least includes, functional anatomy, unless pathology includes functional pathology, and unless time is provided for teachers in the physiologic sciences to cover the problems of deranged function.

Until recently the assumption by fundamental science teachers in medical schools was that their function consisted in teaching students all there was to know about the particular branch under consideration. My main thesis is that the entire fundamental medical science curriculum deserves to be rebuilt on the premise that only those things should be included in the subject matter of the curriculum in any of the special branches which are fundamental to the understanding of clinical medical problems and that their emphasis should be determined by their relative importance to the professional objectives. Such a fur-

mula will not simplify the problem of determining the content of preclinical courses. In fact, the problem has been made more complex. It is the advance in knowledge which is responsible for our difficulties. In general the older branches of the fundamental medical sciences are particularly cluttered up with traditions in the content of courses. Anatomy, physiology, pathology and the older pharmacology are full of hoary old customs in this regard. An example may be found in the mechanical aspects of muscle contraction. Muscle-nerve physiology is important as a means of studying the principles of the behavior of excitable systems, but the emphasis placed on many points has been exaggerated. I question the utility of the study of long lists of little used agents in pharmacology or the detailed study of the origin, insertion, innervation, blood supply and relations of every muscle in the human body.

Again risking censure, I suggest that the attention paid to histologic diagnosis of neoplastic diseases in pathology is unwarranted on the scale of relative usefulness. It is no more important to know about the cytology of a tumor than it would be to know about its characteristic metabolism. The number of physicians competent to make a histologic diagnosis of tumors is vanishingly small. The job today is turned over to a specialist.

However much we regret it, the fact is that no physician could be technically competent to do the laboratory procedures, and other special studies on the basis of the results of which diagnoses must be made. There are still voices crying that it should be possible, but the species of physician that had these several capacities adequately developed vanished with the rise of modern medicine. This point has an important bearing on the philosophy of medical education. If one insists that a physician must be a universal expert, then there is no detail more or less important to him than any other. Then nothing less than complete familiarity with all available knowledge will do. I am by no means suggesting that a physician should not be competent to carry on some simple laboratory studies himself or that he should not be acquainted with the principles of all of them, because I believe he should; I am only arguing that it is unreasonable to expect him to have the technical competence to carry on many of the more ticklish ones satisfactorily. The very existence of a large number of professional clinical pathologists would seem to be proof that the great body of physicians themselves agree with this thesis.

A part of the responsibility for teaching physiology belongs to the clinician. It is never the responsibility of preclinical science teachers to integrate knowledge in relation to a specific disease situation. That is obviously the job of the clinician. I have purposely spoken of "applicable" material rather than "applied physiology" or "applied bacteriology." Applied physiology is an integral part of clinical medicine. The clinical teacher can never be relieved of his ultimate responsibilities in the integration of knowledge from the several fundamental disciplines. With further advances in the understanding of the processes of disease, the clinician will necessarily have to assume increasing duties in the teaching of applied biochemistry and physiology.

It seems fairly obvious that the progress in medical science has altered the relative importance of the several fundamental sciences and of the several divisions of those sciences; that the widespread discontent over the adequacy of teaching of functional phases of the preclinical sciences is due to several causes, one of which is the failure of teachers to determine emphasis on the basis of professional significance, and another is the relatively inadequate portion of the medical curriculum devoted to functional or dynamic as opposed to descriptive studies. There is no simple solution to these problems. Our task as medical teachers is to face the situation with a willingness to restudy our objectives and to revamp the curriculum in the light of contemporary rather than historical needs.

Opportunities for a Medical Career in the Federal Civil Service

DR. A. RAY DAWSON, Washington, D. C.: The objective of the federal civil service, or merit system, is to provide the public service with the best qualified personnel possible. When a

department or independent establishment notifies the commission that it will need a certain number of physicians to fill its contemplated vacancies, this notification starts the commission's machinery toward supplying the need. An examination announcement is written. Announcements of examinations and application forms may be obtained from any first class post office and by writing the Civil Service Commission at Washington, D. C., or any one of the thirteen district offices of the commission in principal cities of the United States. When the commission has determined that a physician meets the minimum requirements there are then sent out certain confidential vouchers. One of the mimeographed sheets is sent to the dean of the college from which the applicant graduated and one is sent to the superintendent of the hospital where the applicant served his internship. In addition, the commission uses letters of inquiry and whatever other available means it has of obtaining information. After the information has been obtained and assembled, the applicant is rated on the basis of education and experience according to a prearranged schedule. One difficulty the commission experiences in filling positions is caused by the restrictions placed by eligible physicians themselves on the geographic area in which they will accept appointment. If a doctor states he will accept appointment only in New York City he is usually not certified to a department wishing to fill vacancies elsewhere. A frequent question is What fields or branches of medical practice are available in the civil service? My answer is all of them, from general practice to the highly specialized fields. If the young man wishes to prepare himself really well for a medical career and is not afraid of hardships, the Indian Service offers the finest opportunity of which I know for the practice of general medicine. This service maintains fourteen sanatoriums for tuberculous patients and eighty-eight general hospitals, including seven in Alaska, ranging in size from twelve to 250 beds with an average of fifty beds. The majority of full time physicians are attached to hospitals, where opportunity is available for intensive experience in all phases of medicine. In addition, most hospitals maintain a very active outpatient department, and home calls, field trips, school examinations and general sanitation constitute an important part of the work, with valuable experience in general practice, home care, administration and public health procedures. Some physicians are assigned to more or less isolated field stations. Additional treatment, consultation and health education in trachoma and tuberculosis are in charge of a corps of special physicians.

There are available appointments in Panama, in Alaska, on board ship, in coast and geodetic survey, and in the census bureau. The largest number of physicians employed by the government are in the fields of general practice, tuberculosis, psychiatry, surgery, public health and, to a less extent, in all of the other specialties. I should like to stress the increasing need for men trained in industrial medicine.

The opportunities for research are excellent, and these opportunities are to be found in practically every department or independent establishment employing civil service physicians. I have but to mention a few examples for you to remember much of the detail of the work that has been accomplished in Rocky Mountain spotted fever, chest surgery, cancer, syphilis, food and drug administration, child welfare and, of course, the large field of sanitation and public health.

The modern emphasis in the federal service is on career service; therefore "in-service training" is playing a large part. "In-service training" has been developed to perhaps its widest extent in the Veterans Administration, which at present is operating a tumor clinic at Hines, Ill., neuropsychiatric clinics at various hospitals, a heart research and clinic establishment at Mount Alto Hospital in Washington, D. C., chest surgery at certain of the tuberculosis hospitals, and in addition to this offers many opportunities at other facilities. The opportunities for training in psychiatry at St. Elizabeth's Hospital, under the Department of the Interior, are, as you know, second to none.

At the close of the fiscal year June 30, 1939, there were sixteen regional offices and eighty-four facilities under the jurisdiction of the Veterans Administration, and 54,117 patients

receiving hospitalization. On completion of new construction for which funds are available, there will be 63,110 hospital beds and 19,464 domiciliary beds, a combined total of 82,574.

To create medical staffs for operation of its newly constructed facilities, to handle the steadily increasing patient load and to fill vacancies created by death, disability or age retirement, the Veterans Administration requires a constant reservoir of young physicians. This need will be urgent for the next twelve months, during which period positions to an estimated number of 300 are proposed. Appointment is subject to a probational status of one year, on the satisfactory completion of which permanent assignments are made. The appointee is first sent to the nearest facilities of the Veterans Administration, at which he is given a training course. If he is found to have the professional and personal qualifications and to be physically able to discharge his duties, permanent appointment is in order. The volume of the medical activities of the Veterans Administration is enormous. Veterans of former wars constitute a public of 4½ million persons who are potentially entitled to treatment.

A young physician entering the federal government for a career cannot expect to get rich quick, but he can look forward to a lifetime of adequate remuneration. His hours of employment will be satisfactory, he will have twenty-six days a year annual leave with pay, which is cumulative to sixty days, and he will have fifteen days a year sick leave with pay, which is cumulative to ninety days. When we consider lifetime employment and lifetime income with the other various features we find that the physician employed by the federal government does much better economically than the average in his profession, and in addition he is enabled to lead a life removed from many of the worries that surround private practice, a life in which he has time outside of working hours to devote to research projects of his own, to hobbies or other pleasures of life.

How the Children's Hospital Can Best Meet Community Needs

DR. ALAN BROWN, Toronto: The contribution of a children's hospital to a community, in my opinion, can probably best be demonstrated by a description of our organization as it exists today. In 1919 the staff of the Hospital for Sick Children was reorganized and plans were laid to establish this hospital along the lines of a center for children's work, the idea being to embrace antepartum care, care of the newborn infant, and care of the child through the period of adolescence. In addition, we felt that we should cooperate with all government and child care institutions. The first big step was the realization that the baby as soon as it was born should become a pediatric problem. The result was that the Toronto General Hospital newborn Clinic was established at the beginning of 1919; since then the newborn clinics of all the general hospitals in the city have been incorporated in this scheme directed from the children's hospital. The result of this procedure has been a reduction in the neonatal mortality to around 24 per cent. This figure is now considered almost the irreducible minimum. The Child Welfare Clinics in the city of Toronto have resulted directly through the interest of the children's hospital in this phase of preventive work. All physicians manning the twenty-six clinics are trained and directed from the children's hospital, and the same applies to the nurses.

About this time the medical director of the children's hospital was made consultant in child hygiene to the School of Hygiene, University of Toronto, the Dominion Department of Health and the Provincial Department of Health, thus enabling practically all phases of children's problems to be guided from the children's hospital. It was suggested to the children's aid societies and children's homes that they be staffed by members of the staff of this hospital. This has been accomplished. As a further effort in cooperation, the physician in charge of infectious diseases in our hospital has been for years physician in chief of the municipal isolation hospital. A small research laboratory was founded in 1917. This has been expanded and since 1919 has been under the Department of Pediatrics of the University of Toronto Faculty of Medicine, the laboratories

being situated in the hospital. At present there are working in the research laboratories ten full time pediatricians, one chemist, one physiologist and seven technicians. The principles laid down early were that all research problems should relate directly to the prevention of disease and the better care of sick infants and children. During the past eighteen years 300 papers have been published dealing with scientific research problems which have been investigated, the most important of which were the development of the infant food Pabulum and original studies on the use of sunshine, skyshine and vitamins.

The professor of pediatrics in the University of Toronto Faculty of Medicine is the physician in chief of the hospital. All the teaching of medical students, postgraduates and nurses from all the general hospitals in this city takes place in this institution. In addition to this, public addresses are given to various service clubs, home and school clubs, and other associations requiring speakers, on every phase of children's work. In 1938 members of the staff of the Hospital for Sick Children gave forty public addresses in different parts of the city and country. One is quite safe in saying that this hospital is applied to for all sources of information regarding children's care from all parts of the dominion. The surgeon in chief of the children's hospital has under his direction all the various surgical specialties that are necessary in such an organization. The care of the sick child is under the direct supervision of ten full time pediatricians and eight attending pediatricians, three neurologists and three dermatologists. This arrangement naturally insures the best of care for the children in the wards. The Junior League of Toronto supplies forty voluntary workers each week to assist in the various clinics of the outpatient department of the hospital, to do occupational therapy work under the direction of a trained therapist on the wards of the hospital, and to collect breast milk throughout the city and bring it to the milk department. In the year 1936 the hospital treated 8,345 cot patients, representing 139,747 patient days. In the same year 8,117 operations were performed, and 98,351 treatments and examinations were given in the outpatient department.

The Integration of Preventive Medicine in the Education of the Physician

DR. S. P. LUCIA, San Francisco: Medicine is a social as well as a natural science. The physician must give as much weight to the study of normal man and his reactions to an ever changing environment as he does to the study of the physiologic mechanisms of biologic phenomena, illness and death. The well-being of man is the responsibility of medicine. The medicine of the future demands socially minded physicians who will work with heart as well as with intellect. Let not technic supersede reason. The physician's view should be more telescopic and less microscopic, as the line between preventive and curative medicine cannot be drawn sharply. Likewise the physician's responsibility to the individual or to the community cannot be differentiated clearly.

The artful diagnosis and empiric therapeutics of the past have given way to the more scientific therapeutics of the present. The science of diagnosis has absorbed or displaced many subjects in the curriculum of a modern medical school. Consequently the physician centers his interest on cure rather than on prevention, on the individual rather than on the group, the environment and other factors of equal importance. There must be a revision of curriculums so that equal weight may be given to prevention, diagnosis and therapeutics.

The curriculums of medical schools are to some extent stereotyped. The organization of the various divisions is vertical, so to speak, and they are more or less isolated as units of surgery, medicine, pediatrics, obstetrics, gynecology and other subjects. The department responsible for teaching preventive medicine fails in its purpose if it is not horizontal and if the major emphasis is not placed on the integration of its services with the special services of the general field of medicine. It is in the division of preventive medicine that all medical, psychological, social and economic influences on man should be considered.

It is an obligation of the modern medical school to teach preventive medicine in the undergraduate curriculum and to accord it a place of major importance along with diagnosis and therapeutics. The application to the individual of the principles of preventive medicine obtained from the knowledge of control of disease in the group is the ultimate aim. One must not confuse this field with the field of public health. It is a part of public health. The field of public health is a specialty, best taught in the postgraduate years. The excellence of public health depends on the excellence of the preventive medicine practiced by the practitioner of medicine. The social consequences of medical practice make it necessary for the physician to have the broadest possible technical training and to carry his interests beyond into the subjects of poverty and its control, housing and its effects on health, the social and health problems of mobile populations, the philosophy of social security, and problems concerned in a more adequate distribution of medical services. Frequently environmental, psychologic, social or economic factors may represent the essential contributing elements in the health of an individual. Their consideration is important in diagnosis, prognosis and treatment.

The plan of instruction in the division of preventive medicine at the University of California extends through the sophomore, junior and senior years. The personnel of this division is charged with the task of correlating the preclinical sciences with the preventive aspects of clinical medicine. The work of the division is closely allied to that of the division of medicine; in fact, all members save one teach in both.

One hundred and forty-four hours is devoted to preventive medicine. This time is allocated as follows: In the sophomore year, eighty hours is devoted to the laboratory aspects of preventive medicine and public health. This is given concurrently with the course in medical bacteriology. An additional thirty-two hours is devoted to didactic lectures in the fundamental subjects dealing with man's environment and with the preventive aspects of the communicable diseases. Sixteen hours in the junior year and sixteen hours in the senior year are devoted to didactic lectures on the relationship of man to his environment and on the organization of individual and community health services.

The personnel of the department consists of two full time and two part time instructors, and in addition special lecturers from the clinical divisions of pediatrics, obstetrics and psychiatry; specialists in technical subjects, parasitology, industrial hygiene and sanitary engineering; a public health officer, an officer from the United States Public Health Service, and the director of the State Hygienic Laboratories.

By a close liaison with the division of medicine, especially through the teaching of clinical medicine, the principles of prevention are better taught and integrated with the general curriculum of the school. An attempt is made to correlate the principles of preventive medicine with the clinical subjects and to give the personnel responsible for this an opportunity to work with the other departments of the medical school. The teaching of the subject is didactic in the division of preventive medicine but practical in the clinics, wards and homes of the clinic patients. The laboratory phases of preventive medicine are stressed in the courses on bacteriology, protozoology and tropical medicine. A short laboratory period is planned for the practical problems involved in the recording of vital data. The domiciliary visits offer the students an opportunity to observe the work of the visiting nurse and the medical social service worker and to study the socio-economic problems of disease. Through the periodic health examinations the students have an opportunity to do routine physical examinations on normal young persons. In the clinic for syphilitic cardiovascular diseases the preventive aspect of syphilis is seen as a practical problem. Field trips and sanitary surveys have been discontinued because it is believed that they are wasteful of the students' time, since they more properly come within the domain of public health.

The broadest concept of medicine is possible only where there are no sharp lines of demarcation between the various divisions of the medical school. The objectives of preventive medicine cannot be attained unless the program of this division integrates with the general medical curriculum. Preventive and curative medicine are inseparable. A desirable combination of services is effective only in the hands of the well trained practicing physician.

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in *THE JOURNAL*, April 6, page 1401.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: *Basic Science*. May or June. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular)*. Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. *Medical (Eclectic)*. Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, April 17. *Written examination*. San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N. St., Sacramento.

COLORADO: Denver, April 2-5. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science*. New Haven, June 8. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DELAWARE: *Examination*. Dover, July 9-11. *Reciprocity*. Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science*. Washington, April 22-23. *Medical*. Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: *Basic Science*. De Land, May 25. Sec., John F. Conn, De Land. *Medical*. Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 25-27. Acting Superintendent of Registration, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical*. Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*. Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, April 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson. NEBRASKA: *Basic Science*. Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination*. Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: *Basic Science*. Oklahoma City, May 9. *Medical*. Oklahoma City, June 5-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Science*. Corvallis, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boorer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 11-13. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WISCONSIN: Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

WYOMING: June 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

Book Notices

Speech Correction: Principles and Methods By C. Van Riper, Ph.D., Director of the Speech Clinic, Western State Teachers College. Cloth. Price, \$2.50. Pp. 434, with 25 illustrations. New York: Prentice-Hall, Inc., 1939.

This book should prove especially helpful to the speech student or the speech correctionist just embarking on his career. It covers the field more comprehensively than almost any other recent book on the subject and does not confuse the reader with too much technical terminology, although now and again the author indulges in the common tendency of the nonmedical man to display the fact that he is fully conversant with medical knowledge and procedures.

The first few chapters are devoted to the anatomy and physiology of the vocal tract and the development of speech. In chapter v the author presents a good discussion of the personality deviations of the speech defective and the necessity for treating the individual as well as his defect. In succeeding chapters he discusses the qualifications of the speech correctionist, case history taking, tests and examination methods. Chapters x to xv inclusive cover the various speech and voice conditions—delayed speech, articulatory disorders, voice disorders, stuttering, cleft palate speech, bilingualism and dialectalism—with suggested therapeutic procedures.

The chapter on articulatory disorders is excellent. It offers the teacher and the speech clinician alike many practical suggestions, methods and technics. The chapter on stuttering summarizes the principal schools of thought on that disorder, but naturally the major portion of it is devoted to a discussion of the theory and procedures which the author advocates. Many workers in the field may disagree with some of his points, especially the significance he attaches to handedness. They may also question the scientific value of his preliminary therapeutic procedure—to make the stutterer precipitate himself into situations which will elicit an increased stuttering response, and to refuse further treatment unless he follows out this injunction. It would seem that this would automatically eliminate the person most in need of assistance—the one whose anxiety neurosis is so pronounced that he finds it impossible to carry out the "assignment." (We of course assume that in reality the author does not peremptorily dismiss the recalcitrant stutterer but makes some further provision for him.)

The prospective speech correctionist may be dismayed by the amount of knowledge and the number of skills the author would have him acquire. In addition to a store of general knowledge, the author would have the speech teacher be able to administer a long list of tests—among them tests for intelligence, achievement, auditory acuity, memory span, laterality and motor coordination—and be able to do laryngoscopic as well as other examinations.

However, these are minor points and the speech correctionist will find the book as a whole a valuable source of reference. It is clearly and lucidly written, with an attractive, readable style, and no other recent work gives such a detailed and systematic survey of the different speech conditions or so many practical suggestions with regard to diagnostic procedures and treatment. The author is also to be commended for his extensive bibliography, which has been carefully compiled in a manner to be most useful to the reader.

Asthma. By Frank Coke, F.R.C.S., with the collaboration of Harry Coke, M.R.C.S., L.R.C.P., Honorary Physician, Charterhouse Rheumatism Clinic, London. Second edition. Cloth. Price, \$4. Pp. 266, with 19 illustrations. Baltimore: William Wood & Company, 1939.

The reader who chooses this monograph with the hope that it is a thorough, complete treatise on asthma will be disappointed. Much of the essential material is treated too briefly, anaphylaxis and atopy in another eighteen pages, the anatomy and physiology of the lung in another eighteen pages. Some of the material included is either obsolete, for example Vaughan's hypothesis of toxic split protein products as the cause of asthma attacks, or controversial. A typical example of the latter is the unequivocal statement (page 117) "It [the active material in pollen] is a polysaccharide." This is accepted by few authorities. No mention is made regarding the obsolete nature of some of the theories

or that other opinions prevail on those questions which are not yet settled. As a result the bibliography is inadequate and limited to only a few papers covering each subject discussed. In discussing the methods of diagnosis, the author fails to emphasize the value of a history and the means for eliciting it. About a fourth of a page is devoted to elimination diet studies. Cutaneous tests are briefly discussed but without mention of their interpretation or the significance of positive and negative reactions. Strangely, the authors warn against ever testing externally with grass pollens because of the danger of a constitutional reaction. This is not our experience in America. In the discussion of the treatment of the severe paroxysm, many important omissions are noted: no mention of helium in spite of a brief discussion of the value of oxygen; no mention of aminophylline in spite of its importance in patients who fail to respond to epinephrine. One of the most serious omissions, according to opinions of allergists in America, is the absence of warning against the danger from the use of morphine in a severe attack. The author advises without a word of caution the use of one-third grain (0.02 Gm.) of morphine subcutaneously in severe attacks. Finally, the basis for this revision as stated by the authors was to establish a classification for asthma. The suggested division is (1) simple allergic asthma, (2) the microbic type and (3) the mixed type (combining groups 1 and 2). This classification is based on protein precipitation curves obtained by adding orthovanadic acid in a buffer acetate solution to the patient's serum. The description of the technic used, in spite of the importance attached to this part of the book, is inadequate and unclear for any one who would wish to perform or even to understand this test. The amount of acid used, the pH of the buffer, the amount of serum—all these details are omitted. The reader is referred by the authors to the original work for almost all the necessary data.

A Text-Book of Gynaecology for Students and Practitioners. By James Young, D.S.O., M.D., F.R.C.S.E., Professor of Obstetrics and Gynaecology, University of London, London. Fifth edition. Cloth. Price, \$5. Pp. 425, with 226 illustrations. New York: Macmillan Company; London: Adam & Charles Black, 1939.

After reading this book the reviewer felt sad. Dr. James Young is one of the greatest gynecologists in the world but one cannot gather this impression from the fifth edition of his textbook of gynecology. In their advertisement the publishers particularly emphasize the section devoted to the recent advances made in the science of sex endocrinology but the author devotes only twelve pages, including illustrations, to this most important branch of gynecology. In the sections on the various menstrual disturbances there is some additional material on endocrinology, but it is still wholly inadequate even though at the present time endocrine therapy has a limited field of usefulness.

Not all of us agree with Young that the translation of "mittelschmerz" is "half-time pain." Likewise not many American gynecologists are in favor of evacuating ovarian cysts by syringe through the cul-de-sac of Douglas in cases of metropathia haemorrhagica. For the latter condition the author also advocates the use of male hormones 50 mg. twice weekly and continued if necessary for one or two months. The reviewer agrees that in some cases of excessive uterine bleeding of functional origin testosterone propionate will control the bleeding, but it is not advisable to recommend to students and practitioners that they give as much as 800 mg. continuously.

The chapter on leukorrhea is only three pages long. Monilia is not even mentioned although it is not an uncommon source of vaginal discharge and, while *Trichomonas* is spoken of, the reader is not told how to recognize this organism. A textbook on gynecology should surely point out the importance of making hanging drop examinations, particularly because it is the simplest and, for most general practitioners, the only way to detect *Trichomonas vaginalis*.

The author devotes a fair amount of space to chronic endometritis. Such a diagnosis was commonly made before Hirschmann and Adler published their monumental study on the endometrial cycle but we now know that chronic endometritis is very uncommon. The author also speaks of senile endometritis (separate from pyometra) which he treats by inserting a drainage tube into the uterine cavity for at least seven days.

In discussing relief of pain in cases of carcinoma of the uterus no mention is made of intraspinal injection of alcohol, although this is a much simpler and more effective procedure than division of the superior hypogastric ganglion. In the section on carcinoma of the cervix, there is no word about the Schiller test or the colposcope.

Most of the illustrations are good but there is a peculiar distribution of them. Two illustrations are reproduced in two different sections and given two sets of figures (vaginal dilator, fig. 48 and fig. 214, and tuberculous disease of the pelvic organs, fig. 81 and fig. 96). In the chapter on vaginal operations only two steps in a vaginal hysterectomy are shown and both of these are reproduced from other authors. There are two illustrations showing a myomectomy and one depicting a myoma screw but only one drawing of a subtotal hysterectomy. This one was borrowed from Kelly and shows the difficult and unusual way of doing a hysterectomy, at least in the United States.

The fact that this book has reached a fifth edition since 1921 indicates its popularity in spite of the foregoing criticisms.

Klinische Behandlung, Arbeitskur und Nachfürsorge bei der Tuberkulose: Drei Vorträge über die Aufgabe der Heilstätte und der Nachfürsorge-Kolonie bei der Wiedereingliederung Tuberkulöser in die Arbeit. Von Dr. W. Bronkhorst, Direktor des Sanatoriums Berg en Bosch und der ADO-Werkstätte Bilthoven (Holland). Nr. 77, Tuberkulose-Bibliothek: Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Bedeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Paper. Price, 5.40 marks. Pp. 44, with 13 illustrations. Leipzig: Johann Ambrosius Barth, 1940.

The problem of returning the tuberculous to industry is as old as the sanatorium itself, but the author brings the subject down to the present in the light of modern perspectives resulting from the rapid development of clinical and sociomedical methods of treatment. Bronkhorst hopes, therefore, that his monograph will aid to awaken new interest in an old problem. Too much stress has been laid on the physical power and too little on the psychic and moral factors. Therefore, gymnastic exercises are not suited to restoration of working power. Only in well organized industrial trades that so far as possible carry a normal character from every point of view can the work cure give its full value. This is to be distinguished from the vocational therapy, the so-called occupational therapy of the Americans. Its aim is "diversion and education through occupation." Occupational therapy also can begin in the phase of clinical treatment when the patient is still bedridden. In the light of an organized, convenient or valuable occupation of the patient during clinical treatment it can be recommended, but it should not be mistaken with the conception of the work cure (*Arbeitskur*). The work cure is basically different from "occupational therapy" even for requiring a possibly favorable clinical and anatomic recovery before the work cure can begin and also because the work cure brings the patient in contact with the conditions of daily life and his regular work.

After considering the changes in type of cases and the results after discharge, Bronkhorst concludes that the dispensary has the function of prophylaxis, early diagnosis and after-care in the individual environment of the ill. The sanatorium serves intensive clinical treatment, work treatment and after-care, which includes all three groups of those requiring work. The tuberculosis divisions of hospitals or tuberculosis hospitals or invalid homes have the problem of hospitalizing the positive invalids. In this sense, when dispensary care, treatment and after-care are organically combined, a successful plan in combating tuberculosis will be followed. Details and hours (dosage) of work treatment are discussed and the basis of work organization considered. In a final chapter (III) the sanatorium Berg en Bosch and the "ADO Werkstätte" are described. Well chosen photographs illustrate some of the industries followed.

This monograph will appeal to all interested in the public health as well as economic aspects of the rehabilitation of the tuberculous and to those interested in and executing the various functions of combating tuberculosis. Although some will consider the book only one man's experience, it is more than that because it records the views evolved from considering a problem and building a plan over many years. This monograph contains valuable information for any one interested in the rehabilitation of the tuberculous from a work and economic

point of view. It might even interest the progressive practicing physician who can read German fluently as a classic illustration of one of the intricacies involved in helping solve the tuberculosis problem in man. The monograph is well composed and printed in the well known manner of the *Zeitschrift für Tuberkulose*.

Epidemiology of Tuberculosis. By Godias J. Drolet, Statistician, New York Tuberculosis and Health Association. Chapter I [of] Clinical Tuberculosis. Edited by Benjamin Goldberg, M.D., F.A.C.P., F.A.P.H.A. Cloth. Pp. 70, with 27 illustrations. Philadelphia: F. A. Davis Company, 1939.

This small volume measures 7 by 10 inches, is bound in blue buckram and is printed on a good grade of paper. The signature of Godias J. Drolet, statistician, is a guaranty of the quality of the material presented and the excellence of presentation. He acknowledges the assistance given by Miss Whitney, statistician of the National Tuberculosis Association. The author has felt that the summary treatment of such a broad subject would be more useful by reducing theorizing and the expression of opinions and by presenting as succinctly as possible, either in graphic or in tabular form, the latest reliable data in order to furnish the competent reader a definite basis to form correct judgments. He felt also, since this volume is primarily by American authors, that manifestations of tuberculosis, particularly in the United States, could best be presented and would be of more immediate interest. Following a satisfactory historical introduction, Drolet points out that the relative importance of tuberculosis varies with the time and the place and, as is well known, among certain groups on which he dwells. Following this he discusses briefly morbidity and incidence. Consideration is then given to the prevalence of infection—among infants, preschool age, school children, high school and university students and adults, with sex, urbanization, rural conditions, contact, color and race, economic conditions, reduction of incidence and the clinical significance of infection being reviewed. The mortality from tuberculosis is dwelt on from the standpoint of large American cities and by states. The mortality in foreign cities and countries is considered. Forms of tuberculosis with regard to various locations and factors influencing mortality such as sex, age, urbanization, color, occupation, housing and race are given appropriate space. Finally the oft disputed and discussed inheritance and sociologic factors close the chapter on epidemiology, ending with twenty well chosen references. Here are made readily available American statistics on tuberculosis such as one may be called on to give at any time and a sufficient sprinkling of foreign information for comparative purposes. If the remaining chapters adhere to the material quality of data presented by Drolet, the set should find an adequate demand from physicians, health workers, statisticians and scientific libraries for frequent reference.

The Merck Index: An Encyclopedia for the Chemist, Pharmacist, Physician, Dentist and Veterinarian Containing Useful Scientific Data and Other Information on the Physical, Chemical and Medicinal Properties, as well as the Various Uses, of Chemicals and Drugs; Also More Than 4,500 Chemical, Clinico-Chemical Reactions, Tests and Reagents; Formulas for Preparation of Culture Media, Fixatives and Staining Solutions; Useful Tables; Antidotes for Poisons; Literature References. Fifth edition. Fabrikoid. Price, \$3. Pp. 1,060. Rahway, N. J.: Merck & Co., Inc., 1940.

Earlier editions are undoubtedly well known to many physicians. Those who are not familiar with it will find that the index is intended to be a practical encyclopedia for the chemist, pharmacist, physician, dentist and veterinarian. Useful information on the chemical and physical properties of some 5,900 substances, listed in many instances by their proprietary names, together with brief statements of their industrial or medicinal uses, comprises 592 pages in the new edition. The present revision appears to be the best of five compilations published since 1889. Many structural formulas illustrate the descriptions of new substances. The scheme of nomenclature employed in the list of chemicals is good, although lapses such as the use of "larocaine" for "larocaine hydrochloride" may be noted. Proprietary names of various substances are abundant in the list, although such names obviously are not exhaustively compended or cross referenced. A number of the newer proprietary pure substances are not mentioned. Such medical information as the volume includes under the various proprietary substances is, in

most instances, similar to that provided by the manufacturers concerned. Substances official in the U. S. Pharmacopeia are so designated.

An interesting addition—one that should be quite useful—is the list by the author's name of 4,510 clinicochemical reactions, tests and reagents. This somewhat cumbersome list is supplemented by a cross list of tests for the various substances concerned.

A condensed description of the coal-tar colors permissible for use in foods, drugs and cosmetics under the new law, a list of indicators with their characteristics, a table of important minerals and their properties, numerous physical and mathematical tables and a list of literature references round out the volume. Merck & Co., Inc., and those who performed the compilation should be congratulated on a tedious job well done.

Der tuberkulös überempfindliche Mensch. Von Dr. med. Eduard Schulz, Oberschreibenhau 1. Rsgb. (Schlesien). Nr. 75, Tuberkulose-Bibliothek: Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, Dirigierender Arzt, Sommerfeld. Paper. Price, 4 marks. Pp. 35, with 9 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

Tuberculosis may be considered an infectious disease and an allergic disease. The former requires the determination of tubercle bacilli for diagnosis and the tuberculous tissue characterized by tubercle. It is known that tuberculosis begins mostly as a primary complex in the lungs, but there is a form of tuberculosis with no determinable primary complex; no tubercle bacilli can be found, but only inflammatory changes are discernible. "Allergy," as known in tuberculosis since Pirquet and described in detail in pulmonary tuberculosis by Ranke, is not being dealt with by the author. "Allergy" to Pirquet meant a "changed reaction ability" of the body. With added information, this has been extended so that it includes the anaphylactic changes. Now the extended allergy is intended to mean the inclusion of an anaphylaxis—a hyperallergy. We know that the tubercle bacillus not only possesses a very high resistance to all contacting influences but exerts a very slight toxicity to man (Hübschmann). This is the basis for the more marked extent and clinically greater manifestation than occurs in other infectious diseases. Thus not only local changes result but the entire cell state of the human organism takes part in the change—it becomes allergic. In the phthisical patient we are concerned with an outspoken organic disease, while in the allergic tuberculous patient we are concerned primarily with a functional disturbance, in which case subjective symptoms predominate. In the allergic tuberculous patient the objective observations of the individual methods do not always suffice for a diagnosis and at times they may controvert it. The entire picture of hyperallergy becomes a basis for the symptoms. The importance of the anamnesis, the tuberculous focal infection, the tuberculin reaction and the blood picture are elucidated by the author with appropriate case illustrations, photographs and roentgenograms. In a final chapter the author's ideas on the treatment of the allergic tuberculous individual are elucidated with a consideration of tuberculin (as important to the internist for desensitization as the knife is to the surgeon); but no pulmonary focus, especially an active one, must exist. As medicaments, calcium preparations, arsenic-iron and gold preparations are to be considered. Climate in resistant cases and baths and water cures should be considered, especially to prepare for the tuberculin treatment, which must be individualized. The author still contributes to the old Naegeli view of 97 per cent of the population being infected. An ingenious chart illustrates three groups of human beings: (1) those in whom infection results in no disease changes (euerigisch), (2) the allergic group and (3) the phthisical—the chronic infectious disease. The campaign against tuberculosis has been considered primarily only for the third group. The first two groups are as good as unexplored in man.

This article is fascinating and worth reading by all interested in the allergic phases of tuberculosis. Many statements may be questioned because of the present unknown nature of certain phases of tuberculosis, but the article presents not only food for thought but food for investigation. Tuberculosis libraries and progressive internists interested in tuberculosis may want a copy for discriminative reading and study. The author considers that in the solution of the allergy problem lies the key to the solution of the tuberculosis problem.

Lane Medical Lectures: Viruses and Virus Diseases. By Thomas M. Rivers, M.D., Sc.D., Director, Hospital of The Rockefeller Institute for Medical Research, New York City. Stanford University Publications, University Series, Medical Sciences, Volume IV, Number 1. Cloth. Price, \$2.50. Pp. 133, with 34 illustrations. Stanford University, California: Stanford University Press; London: Oxford University Press, 1939.

This book includes the five Lane medical lectures on viruses and virus diseases given at Stanford University in 1939. The chapters are on lymphocytic choriomeningitis, the pathology of virus diseases, immunologic and serologic phenomena of virus diseases, the nature of viruses and the treatment and prevention of virus diseases.

United Hospital Fund of New York: Sixtieth Year Book 1939. Paper. Pp. 51. New York, 1939.

The annual report of the United Hospital Fund for 1939 contains, as usual, much information concerning the character and extent of hospital service in the New York metropolitan area. Most illuminating, however, are the statistics which indicate the amount of hospital care provided by public and private agencies respectively. Of all persons hospitalized, the voluntary hospitals cared for 62 per cent and the municipal institutions for less than 38 per cent. On the other hand, voluntary hospitals were filled to 74 per cent of their capacity while municipal institutions were vastly overcrowded as indicated by an occupancy of 99 per cent. In New York the private hospitals are reimbursed by the city to some extent for the care of indigent patients but it would seem that there is still room for improvement in the direction of a more even distribution of the load.

Virus and Rickettsial Diseases with Especial Consideration of Their Public Health Significance. A Symposium Held at the Harvard School of Public Health June 12-June 17, 1939. Cloth. Price, \$6.50. Pp. 907, with illustrations. Cambridge: Harvard University Press; London: Oxford, 1940.

A symposium on virus and rickettsial diseases was held at the Harvard Medical School in the summer of 1939. The published compilation of that symposium contains contributions from such eminent authorities as Zinsser, Gordon, Russell, C. K. Drinker, McKhann, Aycock and Fothergill. It represents an invaluable contribution to the summarization of present knowledge of viruses and diseases caused by them.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Act: Legislative Regulation of Advertising Upheld.—The defendant, a dentist practicing at Easton, Mass., sent out a letter of advertisement offering his services. On the ground that the letter contained certain words and statements of a character tending to deceive and mislead the public and otherwise offended against the Massachusetts statute regulating advertising by dentists, he was indicted and tried in the superior court, Suffolk County. On conviction, he appealed to the Supreme Judicial Court of Massachusetts, Suffolk, which overruled his appeal.

The statute, said the Supreme Judicial Court, is evidently intended to prohibit advertising of professional service and its incidents. The essence of the statute so far as it relates to the several counts in the indictment, said the court, is (1) that no person practicing dentistry and no dental hygienist shall include in any manner of advertising any written or spoken words or statements of a character tending to deceive or mislead the public or claiming ability to perform painless operations of a dental or oral surgical nature, or tending to solicit patronage, or advertising to use any system of anesthetics without truly and accurately naming it; (2) that no person practicing dentistry and no dental hygienist shall make any promise, guaranty, offer, inducement, representation, statement or reward of a character tending to influence, persuade or induce persons to seek, employ or patronize his business, service, advice or products but (3) that certain acts that would apparently be prohibited by the two prohibitions just stated might under certain conditions be performed.

In short, said the Supreme Judicial Court, the statute purports to deny to a registered dentist, such as the defendant, not merely the use of dishonest or deceptive advertising but also the right to seek patronage through advertising in modes deemed harmless and rightful when employed in commercial business.

The legislature may regulate advertising even in commercial business when the public interest so requires. In the professions the right to restrict advertising is broad and clear, and dentistry is undoubtedly a learned profession. The learned professions, said the court, quoting from *McMurdo v. Getter* (Mass.) 10 N. E. 2d, 139, "are characterized by the need of unusual learning, the existence of confidential relations, the adherence to a standard of ethics higher than that of the marketplace, and in a profession like that of medicine by intimate and delicate personal ministration. Traditionally, the learned professions were theology, law and medicine; but some other occupations have climbed, and still others may climb, to the professional plane. *United States v. Laws*, 163 U. S. 258, 16 S. Ct. 998, 41 L. Ed. 151. Dentistry, a branch of medicine, has done so within modern times." Continuing, the court said,

The granting of a license to practice a profession, signifies only attainments warranting entrance into professional life. With some, admission to practice is only the beginning of a lifetime of study, self-improvement, and advance in knowledge and skill. With some others, it marks the end of systematic study and of substantial progress in professional competence. The Commonwealth has an interest in attracting to the learned professions men of ability, capable of adorning them, and in enabling such men to survive in competition with others. It has an interest in spreading as widely as possible among its citizens the benefit of the professional services of the most competent practitioners as distinguished from those who barely possess the minimum qualifications for beginning practice at all. It has an interest in leaving its professional men free to improve their professional qualifications, without the necessity of devoting time and effort to the competitive pursuit of clients or patients. It has an interest, too, in freeing its citizens from the pressure of salesmanship in the formation of confidential professional relations.

The Legislature might find, and apparently did find in the case of dentists, that these public interests would be injuriously affected by free competition among practitioners without restraint as to methods. The Legislature might consider that in general practitioners of high character, deep learning and great skill are more conscious of vast areas of knowledge not yet explored than of the narrow fields in which they may have attained mastery; that they are restrained in speech, and careful that promise never outruns performance; and that as a class they either are incapable of advancing themselves by brazen self-laudation, or scorn resort to that means. The Legislature might conclude from human experience that practitioners of scant competence, like charlatans and demagogues, are likely to make up for want of genuine merit by an expert knowledge of mass psychology and great skill in appealing to the hopes and emotions of the uninformed and credulous. Advertising practitioners, as fast as discovery of their comparative incompetence causes the loss of clients or patients, for a long time can obtain new ones through skilful publicity. It may be that even with complete freedom in advertising, practitioners of unusual competence ultimately would succeed and others ultimately would reach the level of their merits; but in the meantime thousands if not millions of citizens might receive inferior service in the belief, induced by skilful advertising, that it was superior. Under the traditional method of professional advancement through the recommendation of satisfied clients or patients, progress may be slower, but it bears more relation to merit. The Legislature, taking the view which has been expressed, might conclude that the regulations made were necessary for the protection of public interests.

The restriction and even the prohibition of advertising by members of the learned professions constitutes a lawful exercise of the police power, and not, as has been contended, a violation of constitutional provisions protecting liberty and property, or discriminatory legislation.—*Commonwealth v. Brown* (Mass.), 20 N. E. (2d) 478.

Workmen's Compensation Acts: Sympathetic Ophthalmia; Rejected Claim for Compensation Reviewable in New Proceedings.—On Dec. 20, 1932, the claimant in this case was awarded compensation for 100 weeks for the loss of vision in his left eye, which had been injured in the course of his employment. The compensation was paid and on Aug. 16, 1934, the injured workman filed a claim for further compensation, alleging that he had suffered complete loss of vision in his right eye as a result of the injury to his left eye two years earlier.

The department of labor and industry, however, on July 11, 1935, rejected the claim, and no appeal was taken. On Aug. 12, 1936, the claimant filed a new claim in which he alleged that he had been industrially blind in his right eye since July 15, 1935, that his vision had steadily grown worse since that time, and that his earning capacity had diminished since testimony was last taken in the case. The department of labor and industry thereupon awarded the claimant compensation for total disability at the rate of \$18 a week, beginning Aug. 7, 1936, and continuing

until further order by the department. From the award the employer appealed to the Supreme Court of Michigan.

Though the claimant's right eye was not directly injured in March 1932, said the Supreme Court, there was testimony that its condition at the time of the award was due to transferred or sympathetic ophthalmia caused by the injury to the left eye, that the claimant was totally blind in his left eye and had only 1/200 of normal vision in his right eye, and that he was industrially blind. The employer claimed, however, that since the order of the department of July 11, 1935, had not been appealed from by the claimant the case was closed and the claimant had no right to renew his claim. But this doctrine, the doctrine of *res judicata*, said the Supreme Court, is limited in its operation when sought to be applied to a man's physical condition which constantly changes and under a statute which provides that weekly payments may be reviewed and ended, diminished or increased as the facts warrant. The department, it was true, had found by its order of July 11, 1935, that the plaintiff had not been proved to be blind in his right eye or to be totally disabled, but in the present proceedings the department found that he was industrially blind and totally disabled, and those findings were warranted by the facts. The order of the department of July 11, 1935, did not prevent the claimant from showing the facts.

While proceedings were in progress the claimant died. The Supreme Court, however, held that the liability of the employer did not terminate with the claimant's death but that the amounts which had accrued to the claimant during his lifetime might be collected by his personal representative. The Supreme Court affirmed the award of the department to that extent.—*Houg. v. Ford Motor Co. (Mich.)*, 285 N. W. 27.

Evidence: Admissibility of Statements Made by Examinee to Examining Physician.—The plaintiff claimed that while she was shopping in the defendant's place of business she was struck a glancing blow on her head and shoulder by a large rug that accidentally toppled over and that as a result she suffered from traumatic neurosis. In support of her claim she offered the testimony of a physician as an expert witness. This physician had never treated her, but almost a year after the alleged injury and about a week or ten days before the trial he had examined her. In the course of the examination the plaintiff told him in detail of her condition before the alleged injury, of the manner in which she was injured and of her condition since the injury. All this the witness was allowed to give in evidence, over the defendant's objection. He testified, too, that the plaintiff seemed to him to suffer pain in the course of the examination. In answering two hypothetical questions the witness assumed that what the plaintiff had told him concerning her condition and the cause of the injury was true, and he concluded that she was suffering from "neurosis" precipitated by the accident that the plaintiff had described. In the district court, Lee County, verdict was given for the plaintiff and judgment rendered on it. The defendant then appealed to the Supreme Court of Iowa.

As a general rule, said the Supreme Court, the law excludes all evidence of mere hearsay declarations made to a witness who is sworn and examined. This is because such declarations are not made under oath and the person making them has not been subjected to cross-examination. An exception to this rule has been recognized in favor of the testimony of a physician who repeats statements of a patient concerning the history of his ailment when those statements have been made in the course of treatment. The courts sense a probability that the patient will not falsify statements made to his physician in the expectation and hope of receiving from him medical aid and benefit. No such presumption can be indulged in, however, and according to the great weight of authority such testimony is not admissible when the patient, having become a litigant, causes himself to be examined for the purpose of qualifying the examining physician to give evidence in a case about to be tried. If testimony could be introduced in that way, an opening would be made for putting before the jury any quantity of self-serving *ex parte* statements.

No well considered authority, said the Supreme Court, had been called to its attention that would sustain the trial court in

overruling the objections of the defendant to the admission of the evidence complained of. The testimony was hearsay and self serving and not within the exception of the rule. The trial court erred, too, in overruling the defendant's objections to the hypothetical questions, based as they were, in part at least, on incompetent testimony. These errors were prejudicial and the judgment of the trial court was therefore reversed.—*Mitchell v. Montgomery Ward & Company (Iowa)*, 285 N. W. 187.

Hospitals, Charitable: Liability to Pay Patient When Profit Results from Operation of Hospital.—The defendant was a hospital organized not for profit. The plaintiff was admitted to the institution as a pay patient and sustained a third degree burn when a nurse placed a hot water bottle against his leg. He sued the hospital and from an adverse judgment he appealed to the district court of appeal of California, where the judgment for the hospital was reversed and the case remanded for a new trial because, for other reasons, the trial court had erred in refusing to submit to the jury the issue of the plaintiff's claim that the hospital was in fact conducted for profit. *England v. Hospital of Good Samaritan*, 16 Cal. App. (2d) 640, 61 P. (2d) 48 (abstr. J. A. M. A. 108:2253 [June 26] 1937). The case was retried and judgment again rendered for the hospital. On appeal, the district court of appeal held that the trial court had erred in refusing to instruct the jury as follows:

You are instructed that the defense of nonliability because of its charitable character is unavailable to defendant, if you find from the evidence that plaintiff had no knowledge or belief that defendant claimed to be or was a charitable institution, and further provided you find that plaintiff paid its regular rates to defendant from which it derived a profit.

—*England v. Hospital of Good Samaritan*, 22 Cal. App. (2d) 126, 70 P. (2d) 692.

The case was tried a third time, resulting in a judgment for the plaintiff, and again the district court of appeal was required to pass on the issues involved.

The findings of the trial court in this third trial of the case, and the district court of appeal, were sufficient to sustain the judgment against the hospital. It was found that the hospital earned a net profit of \$62,767 for its operation during the year that the plaintiff applied for admission to the hospital and was received as a patient paying the minimum rate of \$25 a week; that at the time the plaintiff applied for admission to the hospital he had no knowledge of its alleged charitable character; that the plaintiff had no knowledge at any time that defendant claimed to be free from liability for negligence on the part of its employees by reason of its alleged charitable character, and that the plaintiff paid the usual and customary rates required and that no charity was requested by nor extended to him. In view of these findings, taken into consideration with the law applicable to the situation as set forth in the instruction already quoted, the district court of appeal affirmed the judgment against the hospital. On appeal, the Supreme Court of California affirmed the judgment of the district court of appeal.—*England v. Hospital of the Good Samaritan (Calif.)*, 88 P. (2d) 27; 97 P. (2d) 813.

Society Proceedings

COMING MEETINGS

American Medical Association, New York, June 10-14. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

Academy of Physical Medicine, Richmond, Va., Apr. 24-26. Dr. Herman A. Osgood, 144 Commonwealth Ave., Boston, Secretary.

Alabama, Medical Association of the State of, Birmingham, Apr. 16-18. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Association for the Study of Gout, Rochester, Minn., Apr. 15-17. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association for the Surgery of Trauma, Atlantic City, N. J., June 7-8. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association for Thoracic Surgery, Cleveland, June 6-8. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.

American Association on Mental Deficiency, Atlantic City, May 22-26. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Broncho-Esophageal Association, New York, June 5. Dr. Paul Holinger, 1150 N. State St., Chicago, Secretary.

American College of Chest Physicians, New York, June 8-10. Dr. Robert B. Homan Jr., P. O. Box 1069, El Paso, Texas, Secretary.

American Heart Association, New York, June 7-8. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Laryngological Association, Rye, N. Y., May 27-29. Dr. C. J. Imperatori, 108 East 38th St., New York, Secretary.

American Laryngological, Rhinological and Otolological Society, New York, June 6-8. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Neurological Association, Rye, N. Y., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 3-5. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Kansas City, Mo., May 6-9. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.

American Otolological Society, Rye, N. Y., May 30-31. Dr. Isidore Friesner, 36 East 73d St., New York, Secretary Pro-Tem.

American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Psychiatric Association, Cincinnati, May 20-24. Dr. Arthur H. Ruggles, 305 Blackstone Blvd., Providence, R. I., Secretary.

American Society of Biological Chemists, New Orleans, Apr. 13-17. Dr. C. G. King, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Secretary.

American Society of Clinical Pathologists, New York, June 6-10. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.

American Therapeutic Society, New York, June 7-8. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

Arizona State Medical Association, Tucson, Apr. 18-20. Dr. Leslie R. Kober, 15 East Monroe St., Phoenix, Secretary.

Arkansas Medical Society, Fort Smith, Apr. 15-17. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

California Medical Association, Coronado, May 6-9. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, Hartford, May 22-23. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Savannah, Apr. 23-26. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Peoria, May 21-23. Dr. Harold M. Camp, 224 South Main St., Moline, Secretary.

Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Kansas Medical Society, Wichita, May 13-16. Mr. Clarence G. Munns, 112 West Sixth St., Topeka, Executive Secretary.

Louisiana State Medical Society, New Orleans, Apr. 22-24. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-24. Dr. Richard T. Shackelford, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Boston, May 21-22. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.

Minnesota State Medical Association, Rochester, Apr. 22-24. Dr. B. B. Souster, 493 Lowry Medical Arts Building, St. Paul, Secretary.

Mississippi State Medical Association, Jackson, May 14-16. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.

Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.

National Gastroenterological Association, New York, June 4-6. Dr. G. Randolph Manning, Room 319, 1819 Broadway, New York, Secretary.

National Tuberculosis Association, Cleveland, June 3-6. Dr. Charles J. Hatfield, 50 West 50th St., New York, Secretary.

Nebraska State Medical Association, Omaha, Apr. 22-25. Dr. R. B. Adams, 416 Federal Securities Building, Lincoln, Secretary.

New Hampshire Medical Society, Manchester, May 14-15. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 4-6. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New Mexico Medical Society, Albuquerque, May 27-29. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.

New York State Association of Public Health Laboratories, Rochester, May 20. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, May 13-15. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.

North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Skelsley, 20½ North Broadway, Fargo, Secretary.

Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Willcox, 210 Plaza Court Bldg., Oklahoma City, Secretary.

Rhode Island Medical Society, Providence, June 5-6. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.

Society of Surgeons of New Jersey, Paterson, May 22. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. E. A. Hines, Seneca, Secretary.

South Dakota State Medical Association, Watertown, May 20-22. Dr. Clarence E. Sherwood, Madison, Secretary.

Texas, State Medical Association of, Dallas, May 13-16. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

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- Effects of Sulfanilamide, Neoprontosil and Sulfapyridine on Erythrocyte Count of White Rats. T. E. Machella and G. M. Higgins, Rochester, Minn.—p. 157.
- Nutritional Microcytic Hypochromic Anemia in Dogs Cured with Crystalline Factor I. P. J. Fouts, O. M. Helmer and S. Lepkovsky, Indianapolis.—p. 163.
- Pernicious Anemia Family: Five Authenticated Cases in Same Generation. F. R. Schemm, Great Falls, Mont.—p. 167.
- Some Observations on Case of Hereditary Hemolytic Jaundice. T. R. Waugh and H. Lamontagne, Montreal.—p. 172.
- Potency of Blood Coagulating Substances: Biologic Assay. P. M. Aggeler and S. P. Lucia, with technical assistance of L. Tyson, San Francisco.—p. 181.
- Traumatic Complications in Peripheral Vascular Disease. H. C. Oard, C. R. Campbell and F. N. Dealy, Jamaica, N. Y.—p. 194.
- Electrocardiographic Studies in Metrazol Shock Therapy: Report of Electrocardiographic Findings Obtained in Treatment of Fifty Schizophrenic Patients with Convulsive Shock Induced by Metrazol. H. Levine, Secaucus, N. J.; G. F. Piltz, Jersey City, N. J., and L. Reznikoff, New York.—p. 201.
- Chloroform Liver Injury Increases as Protein Stores Decrease: Studies in Nitrogen Metabolism in These Dogs. L. L. Miller and G. H. Whipple, Rochester, N. Y.—p. 204.
- Arsphenamine Liver Injury Modified by Diet: Protein and Carbohydrate Protective, But Fat Injurious. W. J. Messinger and W. B. Hawkins, Rochester, N. Y.—p. 216.
- Use of Vaporized Bronchodilator Solutions in Asthma and Emphysema: Continuous Inhalation Method for Severe Asthmatic States. D. W. Richards Jr., A. L. Barach and H. A. Cromwell, New York.—p. 225.
- Quantitative Relationship Between Chloride and Sodium Excretion in Urine. F. Mainzer, Alexandria, Egypt.—p. 232.
- *Danger of Forcing Fluids in Malnutrition. J. A. Evans and H. Shulman, La Crosse, Wis.—p. 237.
- Seasonal Variation in Water Content of Respiratory Tract. E. M. Boyd and G. M. Johnston, Kingston, Ont.—p. 246.
- Disease and the Negro: Thyroid Involvements. G. Walsh and R. M. Pool, Fairfield, Ala.—p. 255.
- Psychiatric Consultation Service in Medical Inpatient Department: Its Function in Diagnosis, Treatment and Teaching. H. S. Ripley, New York.—p. 261.
- *Initial Nervous Syndrome of Pellagra and Associated Deficiency Diseases. J. P. Frostig, Berkeley, Calif., and T. D. Spies, Cincinnati.—p. 268.
- Absence of Reactions Following Therapeutic Doses of Nicotinic Acid Amide. H. Field Jr. and W. D. Robinson, Ann Arbor, Mich.—p. 275.

Danger of Forcing Fluids in Malnutrition.—Evans and Shulman point out that a combination of malnutrition with unsuspected hypoproteinemia and a dry tongue may seem a prime indication for administering large amounts of dextrose in saline solution. As the result of specific protein starvation, hypoproteinemia may be present even in the obese patient. The edema in a case reported by the authors disappeared on transfusions of blood, and in another case it disappeared when 5 per cent dextrose in saline solution was substituted for 5 per cent dextrose in distilled water. The authors conclude that too much salt and water intravenously in cases of malnutrition precipitates an edema already potential by reason of the lowered osmotic pressure of hypoproteinemia. Hydremic plethora with its increased intracapillary pressure further conditions the organism for the precipitation of acute pulmonary edema.

Pellagra and Associated Deficiency Diseases.—Evidence accumulated from the study of more than a thousand pellagrins in the past ten years has convinced Frostig and Spies that psychoneurotic symptoms possess certain distinctive characteristics which may be utilized in making an early diagnosis of the disease. These symptoms improve dramatically following nicotinic acid therapy. A satisfactory study of their characteristics has not been reported since the initiation of this therapy. The authors made a special study of the initial nervous symptoms in sixty cases of subclinical and mild pellagra often associated with beriberi and riboflavin deficiency. The investigation was restricted to an analysis of the symptoms and experiences

reported by the patients. There was an amazing uniformity of mental symptoms which varied in intensity and had no connection with the personality of the patient. These symptoms were classified into psychosensory, psychomotor and emotional disturbances, and into general symptoms of the central nervous system, such as weakness, increased fatigability, sleeplessness and headaches. The first group of symptoms resembles those which may be found in disease of the basal ganglions and the thalamus, while the second group represents general symptoms which usually accompany any disturbance of the central nervous system. Sleeplessness and headaches of pellagrins exhibit some special features which are uncommon and are therefore useful in making a differential diagnosis. In many cases, sleeplessness was a major symptom. Patients usually fell asleep between 12 and 2 o'clock at night and awakened at about 5 in the morning. Frequently even this short period of sleep was interrupted. The patients stated that their sensory disturbances did not prevent them from falling asleep or cause them to awaken, thus further differentiating this nervous syndrome from the usual one of psychoneurosis. In spite of the constant apprehensive attitude, no bad dreams or nightmares were reported. Many patients report having had "sick headaches" since childhood. The headaches resembled migrainous syndromes in many features. They usually occur suddenly. They are localized in the forehead and temples and are accompanied by scintillating scotomas. Nausea and vomiting were reported frequently and sometimes relief followed vomiting. Many patients had dizzy spells along with the headaches. The headache is clinically indistinguishable from migraine. To determine the effect of certain of the nutritional substances, pellagrins were given large amounts of either cocarboxylase, nicotinic acid, riboflavin or synthetic vitamin B₁. The intravenous injection of cocarboxylase or vitamin B₁ produced an immediate reversal of the neurologic signs within a few hours, while nicotinic acid, administered orally, produced a similar effect after a longer time. The oral administration of riboflavin had no such effect on the symptoms arising from the nervous system. The investigation indicates that nutritional deficiencies may cause a disintegration of the personality, including a breakdown of morale.

Annals of Surgery, Philadelphia

111:161-336 (Feb.) 1940

- *Considerations in Use of Ultraviolet Radiation in Operating Rooms. C. J. Kraissl, J. G. Cimiotti and F. L. McIneny, New York.—p. 161.
- Miller-Abbott Tube as Adjunct to Surgery of Small Intestinal Obstructions. O. C. Leigh Jr., J. A. Nelson and P. C. Swenson, New York.—p. 186.
- Acute Appendicitis: Twenty Year Clinical Survey. L. J. Morse, Richmond Hill, N. Y., and M. J. Rader, Brooklyn.—p. 213.
- Studies of Liver Function by Means of Quick's Hippuric Acid Test. J. G. Probst and S. Londe, St. Louis.—p. 230.
- Studies on Cause of Death in Tetanus. W. M. Firor, A. Lamont and H. B. Shumacker Jr., Baltimore.—p. 246.
- Thyroid Disease in Nonendemic Area: Third Series of Observations. U. Maes and S. A. Romano, New Orleans.—p. 275.
- *Autogenous Transplantation of Fibrosarcoma of Skin During Application of Full Thickness Skin Graft. G. T. Harrell, Durham, N. C., and A. deT. Valk, Winston-Salem, N. C.—p. 285.
- Blood Borne Pyogenic Infections of Bones and Joints. F. Beekman and J. E. Sullivan, New York.—p. 292.
- Treatment of Fractures of Neck of Femur by Internal Fixation. J. O. Rankin, Wheeling, W. Va.—p. 315.

Ultraviolet Radiation in Operating Rooms.—After four years of experimental and clinical experience with ultraviolet radiation in the operative field, Kraissl and his colleagues state that the unsterile air in the operating room is an important source of wound contamination. This contamination may be practically eliminated by the use of ultraviolet radiation, in the proper spectrum, with an intensity that will not injure tissue, a point according to them not sufficiently emphasized. An ultraviolet generator applied to an illuminating unit concentrates this radiation in the most critical area, automatically controls the intensity of radiation and, when bacterial concentration is greatest, produces the maximal effect. Surgeons are cautioned to determine that the quality of the radiation is in the most efficient part of the spectrum and that the intensity is great enough to render the air relatively sterile and yet not so great that it will injure tissues for the period during which they will be exposed to the radiation. Auxiliary units should be placed on the walls of the operating room in such a way

that sufficient intensity is developed in the entire room to keep the air relatively sterile. Each unit consists of a 30 inch generator with a control to regulate its intensity, and with the use of a radiometer it is possible to determine accurately the radiation in any part of the room and to raise it or lower it according to the requirements. With the radiometer clicking thirteen times per minute for thirty minutes, under the conditions of the aforementioned installation, the authors felt that air borne organisms were controlled and the viscera not injured.

Autogenous Transplantation of Fibrosarcoma.—Harrell and Valk report an accidental autogenous transplantation of a cutaneous fibrosarcoma which developed in the scar of an old injury, following repeated traumas and infections resulting in recurrent ulcerations. The transfer from the right heel (diseased site) to the left thigh (donor site) was effected during the application of a full thickness pedicle skin graft either by direct extension through the graft or by accidental contamination of the incision at the donor site. It is possible that by some unnoticed break in technic tumor cells were carried, perhaps by the knife, from the malignant growth on the heel to the incision on the left thigh at the time that the skin graft was raised and applied to the heel. Contamination by direct contact is unlikely, for the two incisions were carefully isolated by dressings. In either event the transplant appeared at the site which was left intact for the preservation of blood supply to the graft. It would seem unlikely that cells were transferred later when the pedicle was excised, for the knife was used only on the "clean" area of the thigh and no sutures were taken. The short time (eight days) during which the graft was in contact with both areas would have necessitated a rapid rate of growth for the tumor to pass by direct extension through either the lymphatics or the blood vessels of the graft. However, rapid growth was observed. Microscopically, a diagnosis of fibrosarcoma was made from a biopsy of the heel. Two and a half months after the skin grafting the right leg was amputated 10 cm. below the knee. The amputation wound healed promptly and the patient was discharged in two weeks. Shortly after discharge, the point on the left thigh at which the pedicle to the skin graft had been excised showed signs of infection, although no open wound had been present for three months. A circumscribed ulcer 3 cm. in diameter developed, similar in appearance to the previous one on the right heel. The ulcer together with the deep fascia overlying the muscle was excised. Microscopically the tissue was identical with that from the right heel, except for more anaplasia and increased numbers of mitoses. Nine months after this excision there has been no sign of recurrence at either site, and the patient is up and about, using an artificial limb satisfactorily.

Archives of Otolaryngology, Chicago

31: 231-390 (Feb.) 1940

- Petrous Pyramid of Temporal Bone: Pneumatization and Roentgenologic Appearance. J. R. Lindsay, Chicago.—p. 231.
Edema of Larynx: Study of Loose Areolar Tissues of Larynx. M. V. Miller, Philadelphia.—p. 236.
*Of What Value Is Roentgen Therapy for Sinusitis? Rhinologic Study of Twenty-Two Cases. E. T. Gatewood, Richmond, Va.—p. 275.
Use of Expanding Esophagoscope for Extraction of Foreign Bodies. E. I. Matis, Kaunas, Lithuania.—p. 283.
Osseous Lesions of Nose and Sinuses, with Special Reference to Hyper-trophic Changes and Tumor Formations. A. T. Smith, Philadelphia.—p. 289.
Vascular Fibroma of Nasopharynx (Nasopharyngeal Fibroma). S. A. Friedberg, Chicago.—p. 313.
Infection with *Aspergillus Niger*: Report of Two Cases. L. Felderman, Philadelphia.—p. 327.
Functional Examination of Hearing. A. Lewy and N. Leshin, Chicago.—p. 344.

Roentgen Therapy for Sinusitis.—A check up on twenty-two cases of chronic sinusitis observed before and after roentgen therapy caused Gatewood to question whether the results generally reported in the literature by roentgenologists are not more apparent than real. Examinations consisted of the taking of histories, clinical inspection, investigation by shrinkage, suction and lavage, and comparison of films taken before and after treatments. There was no definite evidence of uniform improvement of the infection following roentgen therapy in spite of x-ray changes. With the exception of a single case, microscopic examination of the polypoid content of eight antrums which had been subjected to roentgen therapy did not show

any obvious difference from similar pathologic contents of other antrums which had not received like treatment. Closer cooperation between the roentgenologist, the rhinologist and the microscopist must be obtained before determining the true effects of this therapy. It is essential that the rhinologist make the final examination in order to avoid erroneous conclusions.

Archives of Pathology, Chicago

29: 153-302 (Feb.) 1940

- Induction of Gastric Tumors in Strain A Mice by Methylcholanthrene. H. L. Stewart, Bethesda, Md.—p. 153.
Studies on Resistance to Transmissible Leukemia in Mice by Means of Parabiosis. O. B. Furth, W. A. Barnes and A. B. Brower, New York.—p. 163.
Reaction of Mouse Skin to Various Reduced and Partially Oxidized Sulfur Compounds. S. P. Reimann and G. Toennies, Philadelphia.—p. 175.
Effect of dl-Methionine and l-Cysteine on Cleavage Rate of Mammalian Eggs. B. J. Miller and S. P. Reimann, Philadelphia.—p. 181.
*Morphologic Appearances of Spirochetal Reproduction in Tissues. G. Steiner, Detroit.—p. 189.
Relation of Elastic Tissue in Root of Aorta to Aortic Valve: Involvement of This Tissue in Syphilis. S. L. Wilens, New York.—p. 200.
*Myasthenia Gravis and Thymus Gland. H. G. Miller, Baltimore.—p. 212.
Additional Observations on Positive and Negative Chemotaxis: Experiments with Myxomycete. D. R. Coman, Philadelphia.—p. 220.
Induced Pulmonary Tumors in Mice: I. Susceptibility of Seven Strains of Mice to Action of Intravenously Injected Methylcholanthrene. M. B. Shimkin, Bethesda, Md.—p. 229.
Id.: II. Reaction of Lungs of Strain A Mice to Carcinogenic Hydrocarbons. M. B. Shimkin, Bethesda, Md.—p. 239.
Pericardial Milk Spots. A. A. Nelson, Washington, D. C.—p. 256.

Morphology of Spirochetal Reproduction in Tissues.—Steiner studied the morphologic appearances in the tissues which result when the local reproduction of spirochetes is initiated. His material consisted of organs from three cases of congenital syphilis, fifty-eight cases of dementia paralytica, among which were three examples of early acute untreated stages of the disease, and the kidneys and other organs of ten rats naturally infected with *Leptospira icterohaemorrhagiae*. The organs (liver, kidney, adrenal, lung and others) from the cases of congenital syphilis contained enormous numbers of spirochetes. The method of division of the individual spirochete could not be made out in the fixed tissues. However, the numerous spirochetes seen in the organs must have been the result of rather rapid spirochetal reproduction. The organisms are diffusely scattered or accumulated in dense ball-like masses. Morphologically these ball-like masses are round or oval accumulations, made up of spirochetes closely packed together, leaving no space for tissue elements. In these large silver stained spirochetal masses the central and inner parts have a light yellow or brownish color, while the outer zone is black. Under the low power these peripheral spirochetal coils tend to form a stellate pattern. At the periphery the spirochetes are arranged in raylike strands, the axes of which radiate from the center of the ball. The raylike strands are made up of well defined black spirochetes. The central part of the mass is seen to be formed by fine, lightly stained spirochetal threads that are infinitely tangled. Such spirochetal conglomerations were seen in the liver, adrenals, hypophysis, intestinal walls and other organs from the cases of congenital syphilis. In all of the cases of dementia paralytica conglomerations of spirochetes were also seen. The author believes that such conglomerations represent centers of spirochetal reproduction. In dementia paralytica the difference in the size and shape of the spirochetal colonies indicates various evolutionary stages of spirochetal reproduction. Areas of military necrosis in congenital syphilis and dementia paralytica are interpreted as the immediate consequence of these reproductive spirochetal conglomerations. This peculiar conglomerative type of reproduction of spirochetes is explained by the following factors. 1. It may be assumed that the reproductive activity of single spirochetes is rapid and that their motility in the tissues is relatively slow. 2. The tissue resistance may in some way prevent the natural movement of spirochetes, for in fluid mediums massive conglomerations are not seen. 3. Some material of glue-like character may be produced by the spirochetes in earlier periods of growth or by the tissues themselves, holding the spirochetes together. The lighter color of the inner parts of the conglomerations could be explained in the same manner. However, if parts of these inner centers are removed and stained for spirochetes, the organisms appear black; con-

sequently the presence of a glue-like material seems improbable. 4. The difference in argyrophilic affinity between the central and the peripheral parts of spirochetal conglomerations may be explained by a difference in density of the spirochetal mass. That the compact inner part may not take the silver salt solution as well as the outer zones explains the difference in color but not the specific type of growth. At present no explanation for this specific conglomerative type of reproduction can be offered.

Myasthenia Gravis and Thymus Gland.—The pathologic observations in five cases of myasthenia gravis encountered among 16,300 necropsies at the Johns Hopkins Hospital are summarized by Miller, who gives only the positive evidence of its relation to the thymus gland. Two of the cases showed an encapsulated tumor of the thymus with remnants of normal thymus outside the capsule, two showed a persistent thymus with well marked peripheral epithelial hyperplasia in one, and in one case the thymus was not identified. This brings the number of reported necropsies in such cases to eighty-seven, in forty-one of which lesions of the thymus were a prominent anatomic feature. In the present five cases abnormalities in the thymus were more common pathologically (four cases) than the characteristic lymphorrhages, which are the accepted criteria of a pathologic diagnosis of the disease. Little can be added to the role assumed by the thymus in the disease. It is suggested that patients with myasthenia gravis be submitted to a thorough x-ray examination and that irradiation and surgical removal of the thymus be carried out more often in the treatment of this disease, which has such an unfavorable prognosis.

Connecticut State Medical Journal, Hartford

4: 59-122 (Feb.) 1940

- The Revised Nurse Practice Act. Agnes K. Ohlson, Hartford.—p. 63.
- Congenital Arteriovenous Fistulas: Reports of Two Cases. B. B. Landry, Hartford.—p. 64.
- Problems of Obstetric Practice in Rural Areas of the United States. E. F. Daily, Washington, D. C.—p. 69.
- Therapeutic Aids in Otolaryngology. F. N. Sperry, New Haven.—p. 74.
- *Crystalline Zinc Insulin with Protamine: Preliminary Note on Newer Insulin Modification. B. Greenhouse, New Haven.—p. 78.
- Vitamin Deficiencies, with Special Reference to Those Involving the Nervous System. E. F. Gilden, New Haven.—p. 83.
- Controlled Physically Induced Fever: Safe and Valuable Addition to Therapeutics. W. B. Snow, New York.—p. 88.
- Occupational Dermatoses from the Point of View of the General Practitioner. J. G. Downing, Boston.—p. 96.

Crystalline Zinc Insulin with Protamine.—Greenhouse describes "crystalline zinc insulin with protamine," being a modified protamine zinc insulin in which the protamine is combined with a solution of zinc insulin crystals as a base instead of the amorphous insulin with zinc as in the commercial protamine zinc insulin. The modified preparation is clinically identical with the commercial product both in appearance and in effect but is superior to it in that it is less allergic. Because of its purity, crystalline insulin has been indicated for those cases in which areas of lipodystrophy develop at the site of injection of regular or protamine zinc insulin.

Illinois Medical Journal, Chicago

77: 97-192 (Feb.) 1940

- The National Health Act. E. R. Burke, Omaha.—p. 127.
- Operative Fixation of Fracture of Neck of Femur. W. J. Potts, Oak Park.—p. 133.
- Endocrines in Relation to Growth in Childhood. I. A. Abt, Chicago.—p. 137.
- Treatment of Postencephalitis, Especially Oculogyric Crises. H. I. Weiner, Dixon.—p. 141.
- Rare Fracture: Rare Cause: Case Report. V. R. Vanstane, Chicago.—p. 151.
- Sulphuretic Abscess. M. H. Judd, Littleton, Colo., and T. R. Hudson, Hines.—p. 155.
- Treatment of Head Injuries. A. Bamberger, Chicago.—p. 159.
- Endocrines and the General Practitioner. G. B. Lake, Waukegan.—p. 162.
- Ophthalmologic Aspect of Disturbances of Endocrine System. E. Selinger, Chicago.—p. 167.
- Roentgenologic Manifestation of Endocrine Dysfunctions. C. Gianturco, Urbana.—p. 171.
- X-Ray Therapy as Applied to More Common Forms of Disturbances of Endocrine Glands. F. Flinn, Decatur.—p. 173.
- Eeground in Hypertensive and Renal Disease. Bertha A. Klien, Chicago.—p. 177.
- Use of Progesterin in Obstetric Complications. F. H. Falls, Chicago.—p. 180.

Journal of Urology, Baltimore

43: 249-426 (Feb.) 1940

- Multiple Adenomas of Kidneys: Report of Case. W. C. Corwin, Philadelphia.—p. 249.
- Evaluation of Roentgenography of Surgically Exposed Kidney in Treatment of Renal Calculi. G. D. Oppenheimer, New York.—p. 253.
- Lichen Planus in Bladder: Report of Case. E. L. Young, Boston.—p. 265.
- Pedunculated Neurofibroma of Bladder. E. R. Mintz, Boston.—p. 268.
- *Total Perineal Prostatectomy. O. S. Lowsley, New York.—p. 275.
- *Influence of Testosterone Propionate on Benign Prostatic Hypertrophy and Spermatogenesis: Clinical and Pathologic Study in the Human. N. J. Heckel, Chicago.—p. 286.
- Carcinoma of Scrotum. R. C. Graves and S. Flo, Walpole, Mass.—p. 309.
- Infarct of Testicle. J. G. Menville, New Orleans.—p. 333.
- Calcium Citrate Uroliths on Low Phosphorus Diet. H. Schneider and H. Steenbock, Madison, Wis.—p. 339.
- Electrocytometergraph: Report of New Instrument. H. E. Landes and H. C. Voris, Chicago.—p. 345.
- Pharmacodynamic Study of Normal Urinary Tract in Children. M. F. Campbell, with technical assistance of Martha Grassmann, New York.—p. 356.
- The Duffy Trocoscope. J. J. Duffy, Los Angeles.—p. 409.
- Neosphenamine in Treatment of Urinary Infections. H. A. Buchtel and E. N. Cook, Rochester, Minn.—p. 417.

Total Perineal Prostatectomy.—Lowsley believes that the value of total perineal prostatectomy has been overlooked by urologic surgeons. He outlines a modification of Young's perineal prostatectomy which offers a slight improvement in the rapidity of healing and also reduces the possibility of incontinence to a minimum. It is suggested that the membranous urethra be joined to the bladder with a mattress suture of ribbon gut; this not only makes the urethra continuous with the bladder but plicates the external sphincter and prevents incontinence. Total or subtotal prostatectomy has been done almost exclusively in early cases of cancer. However, the procedure lends itself to certain other pathologic lesions of the prostate. An early malignant growth of the prostate is particularly suitable for radical perineal prostateseminal vesiculectomy. Chronic pyemia of the prostate is another pathologic condition which is suitable for total prostatectomy. The prostate occasionally becomes so infected that no amount of palliative treatment will effect a cure. In such cases total prostatectomy is indicated. Transurethral resection of the gland is unsatisfactory. Chronic fibrosis produces symptoms out of all proportion to the gravity of the lesion present. No amount of palliative treatment seems to be effectual, so that total removal of the prostate is a quick and effective method of curing the condition. Chronic tuberculosis of the prostate is often accompanied by calcium deposits. When such a condition exists, total prostatectomy is indicated. In acute or subacute tuberculosis of the prostate, operation is distinctly contraindicated. In certain cases of adenomatous hypertrophy of the prostate and prostatic calculosis, total prostatectomy should be performed. The author performed total and subtotal prostatectomy in forty-three cases. Four (9.3 per cent) patients died in the hospital. All the deaths occurred in cases of carcinoma. The average span of life following subtotal prostatectomy for relief of obstruction to urination due to cancer of the prostate in the author's series is approximately two and one half years. One patient lived more than six years and another five and one half years. Both of these men were free from urinary distress, but the disease was widespread when they died.

Testosterone Propionate for Prostatic Hypertrophy and Spermatogenesis.—Heckel studied the effect of testosterone propionate on the proved benign prostatic hypertrophy and spermatogenesis of twenty-two unselected patients. The testosterone propionate was given intramuscularly to most of the patients in daily injections of from 5 to 30 mg. Nine patients were hospitalized and studied independently by the urologic staff before a transurethral resection was done and thirteen patients were not operated on following injections of the substance. The average age of the nine patients was 72.22 years and of the others 70.23 years. The entire group was treated from four to fifty-six weeks. The results following treatment showed no marked improvement in the symptoms or clinical course. The benefits that did occur were mild and were no greater than the improvement commonly seen when the patient is prescribed soda and sitz baths. There was no

noticeable reduction in the residual urine. Testosterone propionate produced a temporary depletion of spermatozoa in patients who had spermatozoa counts within normal limits. In ten of twelve patients an oligospermia was produced.

Military Surgeon, Washington, D. C.

86: 97-224 (Feb.) 1940. Partial Index

- Mobile Treatment Unit in Control of Syphilis. R. A. Vonderlehr.—p. 97.
- *A New Finding in Blood of Influenza. H. H. Parsons.—p. 101.
- Röntgen Therapy in Gas Gangrene: Experience at Station Hospital, Eighth Corps Area, Fort Sam Houston. A. Bowen.—p. 107.
- Emergency Treatment and Primary Apparatus for Fractures of Jaws in Warfare. L. C. Fairbank and R. H. Ivy.—p. 124.
- Injuries of Wrist. D. Fisher and J. Segal.—p. 134.
- Syphilis, Its Significance, Importance and Control in the Military. E. H. Marsh.—p. 155.
- Traumatic Surgery in Its Relation to Military Service. W. W. Lasher.—p. 162.
- Vitamins for the Pilot or the Importance to the Pilot of a Balanced Diet. M. M. Kafka.—p. 167.
- Psychoses Following Trauma. T. H. Fox.—p. 178.

Eosinophilic Bodies in Influenza.—According to Parsons, in most virus diseases in which he has examined the blood it is possible to demonstrate minute acidophilic (eosinophilic) bodies and he finds influenza to be no exception. Since 1935 he has made it a practice not to make a diagnosis of influenza unless, in addition to the usual clinical and laboratory observations, these minute eosinophilic bodies could be demonstrated both in the erythrocytes and free in the plasma. The bodies can be shown in most cases by using Wright's stain. In a typical case the bodies are found in great numbers in and out of the erythrocytes as refractile, mildly eosinophilic, minute oval, round or slightly elongated objects. From one to several may be seen in a large proportion of the red blood cells, while in the plasma they occur in irregular groups or they may be more or less evenly distributed. They are present from the inception of the disease and are often most abundant on the fourth day. They have been found as late as the ninth day and they are probably present for some days thereafter. Their number seems to coincide roughly with the severity of the disease, being abundant in severe cases. They are not ordinarily found in the leukocytes, but in cases of influenzal empyema they are found in the pus cells and also free in the pleural exudate. The appearance of these bodies is characteristic; they resemble those found in the common cold except that in the latter they are accompanied by darker staining, heavier appearing bodies that are round, or round with part of the circumference thinned out giving them a three fourths moon appearance.

New England Journal of Medicine, Boston

222: 205-246 (Feb. 8) 1940

- Further Studies on Treatment of Peptic Ulcer with Aluminum Hydroxide Gel. E. S. Emery Jr. and R. B. Rutherford, Boston.—p. 205.
- *Omentectomy as Safeguard Against Recurrence of Omental Adhesions. C. L. Larkin and Virginia G. Burnham, Waterbury, Conn.—p. 208.
- Prognosis of Infantile Tuberculosis. C. A. Smith and W. DeLacey, Boston.—p. 213.
- Gangrene of Scrotum and Repair by Simple Plastic Operation: Report of Case. H. H. Howard, Boston.—p. 217.
- Urethritis Follicularis. I. J. Zimmerman, Manchester, N. H.—p. 221.
- Syphilis. C. G. Lane and G. M. Crawford, Boston.—p. 224.

Omentectomy as Safeguard Against Adhesions.—Larkin and Burnham point out that omental adhesions cause distressing gastrointestinal symptoms and chronic invalidism and that up to the present time no satisfactory method has been proposed that would prevent this complication. The almost universal practice seems to be to let the omentum alone except where by its adherence it causes definite obstructive symptoms or displacement of the organs. In such cases the omentum is freed at the point where a dysfunction is being caused and is allowed to drop back into the abdomen, no attempt being made to free any more of it that may be adherent elsewhere. Surgeons have realized the seriousness of adhesions following operations and have tried all sorts of means to prevent them. Innumerable solutions, gases, oils, waxes and membranes—such as oxygen, nitrogen, air, salt solution, dextrose, sodium citrate, olive oil, hydrous wool fat, gelatin, paraffin, gum arabic, silver foil, guttapercha, Cargile membranes, amniotic fluid and silk—have been tried, and they have all produced the very thing that they were introduced to prevent. The authors, in performing

pelvic operations, free the adherent omentum by cutting the weblike or fibrous connective tissue that attaches it to the peritoneum. Traction is next placed on the freed omentum, and it is pulled through the incision. When it is pulled upward, the transverse colon is visualized and the attachment of the omentum to its superior border is noted. A suture is placed through the border of the omentum at the hepatic flexure, and the omentum is cut through just distal to the tie. The excision is continued along the upper border of the transverse colon to the splenic flexure. As soon as the heavy omental apron is removed, the whole colon has a tendency to be drawn into the upper abdomen above the umbilicus by the shortened greater omentum, which runs from the greater curvature of the stomach to the upper border of the transverse colon. Consequently there is no longer a fat pad covered with serous membrane between the small intestine and the parietal peritoneum. This leaves a thin, raw area, about 0.3 cm. thick, stretching along the whole superior border of the transverse colon. The outer and inner surfaces of this area consist of a thin layer of epithelial cells, and in between are fat tissue and a lacework of connective tissue; there is no injured parietal peritoneal surface in the upper part of the abdomen to which the cut edges of the incisional wound can adhere. The cut edges naturally adhere to each other, being contiguous and raw. The injured parietal peritoneum in the pelvis comes in contact only with the visceral peritoneum, and the viscera, continually changing position, do not stay in one place long enough to adhere. The authors place special emphasis on anesthesia that produces complete abdominal relaxation. The histories of the seventy-six patients from whom in the last seventeen years either all or a large part of the omentum has been removed were reviewed. Except for two cases concerning which information is lacking, none have had to undergo a subsequent laparotomy because of complications arising from the removal of the omentum. Omentectomy was only one part of the operative procedure, and therefore the good results following these operations cannot be attributed to the removal of the omentum, but at least it has enhanced rather than lessened the patients' chances of good health.

New Jersey Medical Society Journal, Trenton

37: 47-94 (Feb.) 1940

- Acute Hematogenous Osteomyelitis: Diagnosis and Treatment. J. E. Toye, Arlington.—p. 51.
- Endocrinology in Modern Practice. W. L. Wolf, New York.—p. 53.
- Indications for Estrogenic Therapy. T. B. Lee, Camden.—p. 54.
- Infantile Paralysis and the Betty Bacharach Home: Preliminary Report. D. B. Allman, Atlantic City.—p. 57.
- Adoption Investigation for the Safety of the Child, the Parents and Society. Ellen C. Potter, Trenton.—p. 63.

New Orleans Medical and Surgical Journal

92: 413-488 (Feb.) 1940

- Hepatitis: Its Etiology, Diagnosis and Treatment. S. A. Portis, Chicago.—p. 415.
- Diagnosis and Treatment of Urinary Infections in Children. J. E. Youman, Shreveport, La.—p. 425.
- Effect of Gastric Digestion on Allergic Power of Pollen. Narciss Thiberge, New Orleans.—p. 430.
- Irradiation Therapy in Endocrine Dysfunction. J. N. Ané and L. J. Menville, New Orleans.—p. 433.
- *Sulfanilamide and Fever Therapy in Treatment of Venereal Lymphogranuloma. J. A. Trautman and H. A. Thomason, New Orleans.—p. 441.
- Artificial Pneumothorax: Treatment of Ambulatory Patients with Pulmonary Tuberculosis. S. Jacobs, New Orleans.—p. 446.
- Abdominal Pregnancy: Report of Case. J. M. Bodenheimer, Shreveport, La.—p. 454.

Sulfanilamide and Fever for Venereal Lymphogranuloma.—Trautman and Thomason add twenty cases to the sixteen cases of venereal lymphogranuloma treated with artificial fever or sulfanilamide and reported in 1938. The duration of the glandular involvement before treatment was begun ranged from six days to 139 days, the average being 35.6 days. In thirty-two cases the duration was less than two months and in only four was the duration more than two months. Of the thirty-six patients, four received fever therapy alone, twenty-nine sulfanilamide alone and three a combination of sulfanilamide and fever therapy. Various forms of treatment were given the remaining patient, who was most uncooperative. As a rule, response was prompt with progressive decrease in pain and swelling of the involved glands, and closure of the drain-

ing areas. Thirty-four patients attained apparent recovery in an average of 17.4 days and were discharged as fit for work at the end of that time. One patient was improved but still had slight painless swelling of the inguinal glands after twenty-seven days of treatment. This patient received sulfanilamide for nine days, following which a generalized maculopapular dermatitis developed. The dermatitis disappeared in a few days. Sulfanilamide was begun again sixteen days after the onset of the dermatitis, and after one dose of 20 grains (1.3 Gm.) of sulfanilamide the dermatitis recurred. Fever therapy was then attempted but the patient refused to continue the treatment after being in the cabinet for not more than one hour. Great improvement was obtained, but the final result is not known as the patient has not been seen since discharge. Only three patients were hospitalized for longer than thirty days; the average hospitalization for the thirty-five patients was 17.6 days. For the four patients receiving fever therapy the average hospitalization was 21.2 days, for the two who had fever therapy and sulfanilamide it was 29.5 days and for the twenty-nine patients receiving sulfanilamide alone it was 16.3 days. For the seven patients who received fever therapy an average of five fever sessions was necessary, or twenty-five hours of fever at a level of from 105 to 106 F. Up to the present no recurrences have occurred. Excision of the involved glands was unnecessary in the thirty-six cases.

New York State Journal of Medicine, New York

40: 235-308 (Feb. 15) 1940

- Present Trends in Treatment of Pneumonia in Children. W. C. Emm, Syracuse.—p. 241.
Use of Amphetamine (Benzedrine) Sulfate in Alcoholism With and Without Psychosis. E. C. Reifenshtein Jr. and E. Davidoff, Syracuse.—p. 247.
Acute Pancreatitis. J. J. Morton Jr., Rochester.—p. 255.
Bowen's Precancerous Dermatitis of Mucous Membrane: Review of Literature and Report of Two Cases. A. C. Cipollaro, New York, and P. D. Foster, Los Angeles.—p. 264.
Value of Stereoscopic Pneumographic Studies in Diagnosis and Localization of Renal and Ureteral Calculi. W. W. Scott and J. A. Benjamin Jr., Rochester.—p. 276.
Mode of Acquisition of Lymphogranuloma Venereum of Anorectal Type. A. W. Grace, New York, and G. W. Henry, White Plains.—p. 285.

Philippine Islands Med. Association Journal, Manila

19: 727-796 (Dec.) 1939

- *Observations on Use of Typhoid Convalescent Serum in Treatment of Typhoid Fever. P. T. Lantim, S. Morales and J. Silva, Manila.—p. 727.
Studies on Vitamin C: VI. Blood Ascorbic Acid in Leprosy. Isabelo Concepcion and Solita F. Camara, with assistance of B. Fulgencio, Manila.—p. 733.
Pneumonia Treated with Sulfapyridine: Seven Cases. S. Y. Orosa, Bacolod, Occidental Negros.—p. 741.
Medicinal Use of Tañigan-Tañigan Oil as Substitute for Imported Castor Oil. R. Guevara, Manila.—p. 745.

Convalescent Serum for Typhoid.—Lantim and his co-workers give the results obtained in seventeen cases of toxic types of typhoid treated with convalescent typhoid serum donated by persons recently recovered from the toxic form of the disease. The serum was separated aseptically from the clot and was tested for sterility and Wassermann reaction. The serum not only influenced the recovery and the fatality rates but the course of the disease as well. Generally, after 20 cc. of serum was administered by either the intramuscular (seven patients) or the intravenous (ten patients) route a noticeable improvement in the appearance of the patients was observed shortly after. There was a gradual amelioration of the toxic symptoms, diminution of delirium, improvement in the pulse and lowering of the temperature. Either the temperature came down gradually or it became intermittent or remittent before reaching the normal. The patients who responded favorably usually experienced a growing feeling of general well being. Although improvement of the toxic symptoms occurred in both series of patients in those treated by intramuscular injections the evidence of improvement was, as a rule, delayed by a few days. Intravenous administration of the serum hastened considerably the onset of favorable reaction and the degree of improvement. Two cases in each group terminated fatally. Of seven control patients (not treated with serum) four died. There were no serum reactions, such as are often observed when heterologous immune serum is employed.

Public Health Reports, Washington, D. C.

55: 227-264 (Feb. 9) 1940

- Disabling Diseases of Childhood: Their Characteristics and Medical Care as Observed in 500,000 Children in Eighty-Three Cities Censused in the National Health Survey, 1935-1936: II. Medical and Nursing Care. Dorothy F. Holland.—p. 227.

55: 265-302 (Feb. 16) 1940

- Limitations of Euglenidae as Polluted Water Indicators. J. B. Lackey and R. S. Smith.—p. 268.
Bacterial Assay of Riboflavin in Urine and Tissues of Normal and Depleted Dogs and Rats. H. F. Fraser, N. H. Topping and H. Isbell.—p. 280.

Rhode Island Medical Journal, Providence

23: 17-30 (Feb.) 1940

- A State Hospital Physician Looks at Health in Rhode Island. C. P. Fitzpatrick, Howard.—p. 17.
Dental Problems of Interest to the Medical Man. R. L. Webster, Providence.—p. 21.

South Carolina Medical Assn. Journal, Greenville

36: 33-64 (Feb.) 1940

- Problems in Minor Traumatic Surgery, with Special Reference to the Hand. S. C. Hays, Clinton.—p. 33.
Sulfapyridine Treatment of Lobar Pneumonia. W. H. Kelley, Charleston.—p. 37.
Epilepsy and Its Management. S. B. McLendon, Columbia.—p. 40.
Cancer of Lung: Successful Pneumonectomies. F. P. Coleman, Columbia.—p. 45.

Southwestern Medicine, El Paso, Texas

24: 1-42 (Jan.) 1940

- Bundle Branch Block: Review of Cases. R. H. Homan, El Paso, Texas.—p. 1.
Treatment of Fractures of Neck of Femur by Internal Fixation. W. C. Campbell, Memphis, Tenn.—p. 3.
Electrosurgery and Radiotherapy for Breast Cancer. B. H. Orndoff, Chicago.—p. 7.
Use of Miller-Abbott Tube. H. D. Cogswell and C. A. Thomas, Tucson, Ariz.—p. 10.
Subserous Cholecystectomy with Cystic Duct Drainage and Lipiodol Injection of Common and Hepatic Ducts. J. H. Patterson, Phoenix, Ariz.—p. 14.
Diagnosis and Management of Acute Intestinal Obstruction: Clinical Study of 100 Consecutive Cases. G. A. Stevens, Hollywood, Calif.—p. 17.
*Incidence of Spirochetes and Fusiform Bacilli in Throat and Gum Smears. E. L. Breazeale and R. A. Greene, Tucson, Ariz.—p. 20.

Spirochetes and Fusiform Bacilli in Smears.—Breazeale and Greene determined the incidence of spirochetes and fusiform bacilli in throat and gum smears of school children of different social and economic levels, of enlisted men and of college students. Of the 719 smears examined, 465 (65 per cent) did not contain the organisms while 254 subjects, or 35 per cent of the group, did harbor the organisms. The lowest incidence has occurred in a group of school children from homes of superior social and financial levels and the highest incidence was among a group of Mexican children from homes of low social and economic levels. These organisms were found in 41 per cent of a group of Negro school children and Indian children at a boarding school. Of the young adults 27 per cent of the enlisted men (Arizona National Guard), 25 per cent of the female college students and 36 per cent of the male college students harbored the organisms.

Surgery, St. Louis

7: 167-324 (Feb.) 1940

- Surgery of Hip Joint from the Physiologic Aspect. W. C. Campbell, Memphis, Tenn.—p. 167.
Branchial Cysts: Report of Two Cases of Cyst of Cervical Sinus. R. B. Malcolm and R. E. Benson, Chicago.—p. 187.
Results of Repair of Ventral Hernias with Sutures of Fascia Lata: Review of Eighty-Five Hernias. C. H. Smith and J. C. Masson, Rochester, Minn.—p. 204.
Disposition of Sac in Operations for Oblique Inguinal and Femoral Hernias. D. A. Willis, Chicago.—p. 212.
Cause and Cure of Inguinal Hernia. P. W. Harrison, Muscat, Arabia.—p. 217.
Spasm of Last Ileal Loop Simulating Regional Ileitis. D. A. Willis, G. C. Coe and J. Arendt, Chicago.—p. 226.
Acute Solitary Diverticulitis of Cecum: Report of Case. A. J. Grace, London, Ont.—p. 232.
Interlobar Perforated Abscess of Lung (Interlobar Empyema). H. Neuhoof, New York, and B. Copleman, Perth Amboy, N. J.—p. 236.
Use of Autogenous Rib Cartilage Grafts to Repair Surface Defects in Dog Joints. F. Young, Rochester, N. Y.—p. 254.
Management of Old Contractures of Hand Resulting from Third Degree Burns. R. Jones Jr., Durham, N. C.—p. 264.
Rupture of Main Bronchus from External Injury. L. H. Clerf, Philadelphia.—p. 276.
Plasma Potassium Following Intestinal Obstruction in Dogs. W. F. Greenwood, R. E. Haist and N. B. Taylor, Toronto.—p. 280.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

52: 1-42 (Jan.) 1940

- Alopecia of Peroneal Regions as Constitutional Sign of Neuro-Arthritic Diathesis. L. Tommasi.—p. 1.
X-Ray Quality and Skin Reaction. G. Schwarz.—p. 10.
Notes on Some Ointment Bases. G. Bamber.—p. 21.
Emulsifying Bases. J. Soulsby.—p. 25.

British Medical Journal, London

1: 159-200 (Feb. 3) 1940

- Injury to Vertebrae Occurring in Royal Air Force: Review of Cases. P. A. Hall and G. H. Morley.—p. 159.
*Convulsions Occurring Under Vinesthene Anesthesia. C. J. M. Dawkins.—p. 163.
Tuberculous Laryngitis: Analysis of 428 Cases. R. S. Stevenson and F. R. G. Heaf.—p. 164.
Some Operative Factors of Seaside Climate. O. H. Kestner.—p. 169.
*Abacterial Pyuria. T. Moore.—p. 170.

Convulsions Following Vinesthene Anesthesia.—During the last two years Dawkins has observed nine nonfatal cases of convulsions among 2,406 vinesthene administrations. The convulsions came on toward the close of the operation and were similar to those encountered under deep ether anesthesia, with the exception that each case had an evipal induction. The literature on ether convulsions does not reveal a single case occurring after premedication with a barbiturate. The intravenous injection of a barbiturate will immediately abort a case of ether convulsions. Therefore a different factor must be present in vinesthene convulsions, as these come on after a barbiturate as well. The five instances of convulsions in the dental group (children from 3 to 9 years of age) occurred after the anesthetic was concluded. Among these children anesthesia was normal and the child was removed to the recovery room. Following the recovery of consciousness twitching of the facial muscles began and was soon followed by twitching of the muscles of the body. The child became unconscious and cyanosed and ceased breathing. Artificial respiration was employed and preparations were made to give evipal, but respiration ensued spontaneously. The convulsions gradually ceased. The color returned to normal and the child would then sleep for about an hour. If awakened earlier it would get up and run about the room, banging its head on the walls and appearing completely incoordinated. On the employment of restraint the child would go to sleep once more and waken later apparently quite normal. Those who were allowed to sleep following the cessation of convulsions awoke normally in about an hour. This "syndrome" has now been accepted by the nursing staff as a normal complication of vinesthene anesthesia and no undue alarm is felt. The nursing staff prefers vinesthene, despite convulsions, to the far greater dangers of ethyl chloride. Careful inquiry into the history of the children revealed no abnormality; each child was seen a week after the anesthetic and appeared to have suffered no ill effects. The author suggests that anesthesia with vinesthene should not exceed an hour in duration.

Abacterial Pyuria.—Moore states that abacterial pyuria is a definite entity, probably caused by an ultramicroscopic virus. He reviews the literature, etiology, symptomatology, diagnosis and treatment and cites a case in which the intravenous injections of 0.3 Gm. of nearsphenamine at weekly intervals for four weeks caused the condition to disappear.

Lancet, London

1: 205-254 (Feb. 3) 1940

- Influenza Epidemic of January-March, 1939. C. H. Stuart-Harris, W. Smith and C. H. Andrews.—p. 205.
*Treatment of Lymphadenoma and Certain Malignant Growths with X-Ray Baths. W. M. Levitt.—p. 212.
*Hypertonic Sodium Sulfate Treatment of Infected Wounds. J. C. Lyth.—p. 216.
Syringomyelia Combined with Taboparesis: Report of Case. E. L. Hutton and A. J. Galbraith.—p. 219.
Protein Requirement in Adolescence and in Middle Age. I. Harris, J. T. Ireland and G. V. James.—p. 220.

X-Ray Baths in Lymphadenoma and Malignant Growths.—Levitt describes a method of x-ray bath irradiation and the results obtained by its use in lymphadenoma and in radiosensitive malignant disease. The observations recorded are

based on 202 cases treated in the ten year period 1929-1939. The term "regional x-ray bath" is used to imply irradiation of the whole thorax with the axillae and neck, or of the whole abdomen with the groins, or a combination of these. The term "trunk bath" denotes irradiation of the whole trunk from the mandible to the groins—the face, head and limbs being protected. Under "lymphadenoma" are included all the diseases in the reticulosis group except reticulosarcoma and the leukemias. The object was to secure the maximal dose consistent with safety, and all parts of the body not to be irradiated were protected. During the first few years treatment was limited to cases that were regarded as hopeless. Later on the indications for the method were widened. High voltage x-rays were used, 180 kilovolts in the earlier cases and 200 kilovolts in the later ones. The filter was 0.5 mm. of copper with 180 kilovolts, and Thoraeus with 200 kilovolts. The focus-skin distances were long, from 60 to 140 cm. according to the size of the field. The method has so far been found of value only in lymphadenoma and in the more radiosensitive malignant growths, namely testicular growths, adenocarcinoma of the ovary, reticulosarcoma (including lymphosarcoma) and Ewing's sarcoma of bone. The indication for the thoracic bath is intrathoracic disease associated with enlarged axillary and cervical glands, though in some cases in which the intrathoracic disease is widespread the bath may be applied even in the absence of enlarged superficial glands. The indication for the abdominal bath is widespread abdominal disease, with or without involvement of the groin glands. In cases in which involvement of the liver and spleen are the main features, without evidence of disease in the lungs or pelvis, a lower thoracic and upper abdominal bath is given. The levels are from the fourth costal cartilage to the umbilicus. The indication for the trunk bath is widespread disease of known radiosensitive type affecting the chest, abdomen and superficial glandular areas. The general effects are variable, depending on the region treated and on idiosyncrasy. The effect on the blood has to be carefully watched throughout the course, and blood counts are carried out at regular intervals. The lower limits which have been adopted as signals for the interruption of treatment are 1,200 total leukocytes or 200 total mononucleated cells per cubic centimeter. The author says that the results are probably little, if at all, inferior to those of local irradiation of local disease of radiosensitive type. Thus a five year survival of two out of seven patients with primary lymphosarcoma without metastases would be regarded as satisfactory. Most of the deaths in this condition are due to metastases, and the question arises whether some form of bath irradiation should not be used in all cases of local disease of known radiosensitive type in the hope of preventing generalization. In the author's opinion there are already sufficient grounds for carrying out such treatment in a small and carefully controlled series of cases.

Sodium Sulfate Treatment of Infected Wounds.—Lyth stated in 1935 that an antiseptic applied to living tissues already invaded by micro-organisms depends for its efficiency on whether it is hypertonic or not. The salt with which he dealt was sodium sulfate and the method advocated was that of soaks of a saturated or nearly saturated solution applied to the surface of infected wounds. In the four years since that time all infected wounds have been treated, apart from immobilization, in this way only, no bactericidal antiseptic having been used; nor was sulfanilamide given to any of these patients. The total number was 1,096. Except those with malignant ulcers, all the patients recovered. The author stresses the startling rapidity with which septic edema melts away when hypertonic solution of sodium sulfate is applied at the point of entry of the infection. He describes several illustrative cases. Sodium sulfate has proved so superior to other salts that he investigated its osmotic properties and compared them with those of sodium chloride and magnesium sulfate, the other two salts in common use. These experiments seem to bear out and possibly explain the author's clinical experience, namely that for the purpose of hypertonic saline dressings for infected wounds sodium sulfate is much more effective than either magnesium sulfate or sodium chloride. He appeals to surgeons and general practitioners, especially those who may be in charge of many infected injuries in this war, to give the hypertonic method a trial and to use a saturated solution of sodium sulfate.

Bruxelles-Médical, Brussels

20: 396-427 (Jan. 21) 1940

*New Procedure of Repeated Alcoholization of Phrenic Nerve: Alcohol-ophrenipexy. G. Derscheid and P. Toussaint.—p. 396.
Neck of Uterus. De Snoo.—p. 404.

Repeated Alcoholization of Phrenic Nerve.—According to Derscheid and Toussaint, paralysis of the phrenic nerve may be induced by one of the four different technics: (1) the simple phrenicotomy of Stuerz, (2) the procedure of Goetz, which consists of exerting a mild traction on the peripheral end of the sectioned phrenic nerve in order to reveal accessible anastomoses, which are sectioned for an extent of from 3 to 4 cm., (3) Felix's evulsion of the peripheral end of the nerve "up to the diaphragm" and (4) the alcoholization method of Henschen. The last named is favored at present because it provides the best chance for a rapid regeneration. The authors perform a phrenicectomy in the relatively rare cases in which a complete functional arrest is desirable, such as ulcerative fibrotic tuberculosis, extensive bronchiectasis and large callous cavities of the inferior lobes. Repeated alcoholization by a new technic was the method commonly employed by the authors. A horizontal cutaneous incision 2 cm. in length and a fingerbreadth above the clavicle is carried across the external edge of the sternocleidomastoid. The base of the muscle is exposed and the median cervical aponeurosis underneath the omohyoid is divided, exposing the anterior scalenus with its aponeurosis, permitting of visualization of the phrenic trunk. The anesthetized trunk is carefully isolated and gently delivered by traction. Every anastomosis revealed by this elongation is sectioned. The loop of nerve, from 3 to 4 cm. in length, is then fixed to the sternocleidomastoid. The alcoholization is performed superficially in order to avoid deep impregnation. The authors had occasion for renewed intervention in three cases in which operations were performed according to this method. They stress the following advantages: 1. Its immediate physiologic results are constant, because of the exposure and sectioning of the accessible anastomotic fibers. 2. It prevents alcoholic diffusion into the deeper layers. 3. It permits of neuro-electrical exploration to evaluate the stages of regeneration. 4. It permits the completion or prolongation of a favorable therapeutic influence by means of a renewed intervention. The renewed alcoholization represents a test intervention, obligatory before resorting to thoracoplasty.

Ophthalmologica, Basel

98: 193-256 (Dec.) 1939

Prognosis and Treatment of Retinoblastoma. J. R. Anderson.—p. 193.
Clinical Peculiarities of Case of Marfan's Syndrome. R. de Saint-Martin.—p. 201.
*Sulfanilamide Therapy of Trachoma. Sie-Boen-Lian.—p. 208.

Sulfanilamide Therapy of Trachoma.—According to Sie-Boen-Lian, sulfanilamide has been used in severe cases of trachoma at the eye clinic in Batavia since the second half of 1937. Some of the patients had been treated previously with other methods, without success. The total number of those treated with sulfanilamide now exceeds 100. Untoward secondary effects of sulfanilamide were observed rarely. They were mild and transient. To avoid them, the author tried local treatment with sulfanilamide but found that only the oral administration of the drug produced favorable results. The sulfanilamide proved effective in checking the secretion and the diffuse thickening of the conjunctiva. The papillary thickening was influenced only slightly and the granulations not at all. The corneal complications of trachoma (pannus, keratitis and corneal ulcers) responded best of all. Recurrences of corneal complications of trachoma were rare after treatment with sulfanilamide.

Lattante, Parma

11: 1-50 (Jan.) 1940. Partial Index

*Treatment of Poliomyelitis with Diphtheria Toxoid. G. Raffaelli.—p. 9.

Poliomyelitis.—Raffaelli employed diphtheria toxoid in the treatment of acute anterior poliomyelitis in a group of fifty-two infants and three children. The toxoid was administered by intramuscular injections given at intervals of four days in increasing doses of from 2 to 6 cc. up to a total of from four to six injections. The treatment was instituted within three days from the onset of the disease in the majority of cases and

within a week in a few instances. No other medical treatment was given. The toxoid was well tolerated. There was neither extension of paralysis nor a fatality in the group. Physical therapy was begun about one month after the discontinuation of the toxoid therapy if sequels were present. In all cases but seven the course of the disease was favorably influenced. The best results were obtained from early toxoid treatment. Complete recovery without sequels was obtained from toxoid therapy alone in twenty-three cases, and from toxoid therapy plus physical therapy of short duration in fourteen cases. The paralyzes are slowly improving in eleven cases under prolonged physical therapy. In seven cases the treatment failed to arrest or to modify the symptoms. The author believes that the treatment with diphtheria toxoid stimulates spontaneous regression of the nervous lesions and regeneration of the nervous tissues.

Archiv für klinische Chirurgie, Berlin

197: 319-510 (Nov. 15) 1939

Portal Vein-Hepatic Circulation, Metabolism and Collapse. G. Zopff.—p. 319.
Experiences with Total Extirpation of Stomach. S. Gotô.—p. 385.
Experimental Formation of Thrombosis by Bacterial Infection and Intravenous Injection of Bacterial Toxin. S. Kaneko.—p. 395.
Pathology and Pathogenesis of So-Called Lunatum Malacia. S. Nagura.—p. 405.
*Clinical Aspects and Therapy of Acute Necrosis of Pancreas. E. Reichl.—p. 428.
Motility of Stomach After Resection. K. Otto.—p. 448.
Problem of Abdominal Suppuration After Incisions in Linea Alba. H. H. Westermann.—p. 477.

Acute Necrosis of Pancreas.—A study of 134 cases of acute pancreatic necrosis revealed that in all except one there were biliary disturbances with indefinite gastric pains or with typical gallstone attacks. Reichl therefore maintains that pancreatic necrosis is a secondary disorder, a sequel of inflammatory disease of the biliary system. He estimates that a primary biliary disorder is the cause of pancreatic necrosis in more than 90 per cent of the cases. This applies to genuine necrosis of the pancreas only and not to cases in which an external cause such as operative trauma or *Ascaris* is the causative agent. In view of the frequency of biliary disease and its role in the pathogenesis of pancreatic necrosis, it appears that the latter is comparatively rare. At the author's clinic the cases of pancreatic necrosis amounted to only 12 per cent of the total number of biliary disturbances. Thus, although biliary disturbance is a factor, the primary provoking cause is still problematic. The various theories regarding it can be classified into three groups: the canalicular, the circulatory and the functional. Reichl believes that several factors are responsible. Opinions are divided with regard to expectant conservative therapy or surgical intervention. Of eighty-nine patients operated on at the author's clinic forty-one died, whereas of thirty-one on conservative treatment only four died. Ten patients hospitalized while in a grave or moribund state died within a few hours or on the same day. The feasibility of conservative treatment rests on a correct diagnosis, which is arrived at by a thorough clinical examination and by the determination of the fasting blood sugar and the diastase content of the urine. The conservative treatment consists of interdiction of food intake for from three to four days, morphine for pain, antispasmodics, stimulation of the intestinal peristalsis by drugs, and warm moist applications and heat to the abdomen. The heart and circulation are supported by the parenteral administration of isotonic fluids and by strophanthin-dextrose-strychnine therapy. If the patient recovers on the conservative regimen, operative intervention on the biliary tract should be resorted to from four to six weeks later, in order to remove the contributing cause. The operation consists of the removal of the gallbladder and of a supraduodenal choledochotomy if the common duct contains calculi or is dilated or inflamed. The choledochus is carefully explored for stones, the papilla is dilated and the duct is irrigated. In order to relieve the pressure on the biliary tree, a Nélaton catheter is sutured into the duct and is left in place for from ten to fourteen days, after which time it can be removed without injuring the duct or causing a fistula. During the last several years, operations on the pancreas itself in the acute stage have been rejected by the author. Residual abscesses and sequestrums are treated in the customary manner. In this way it has been possible to reduce the mortality to 12.9 per cent.

Münchener medizinische Wochenschrift, Munich

86: 1687-1714 (Dec. 1) 1939. Partial Index

War Epidemics in the Sino-Japanese Conflict. A. Schretzenmayr.—p. 1687.

Action of Daily Dose of Depot Insulin. H. Oeller.—p. 1689.

Blood Sugar Determination and Preparatory Treatment of Blood Specimens. K. Dirr and H. Stengel-Munzert.—p. 1694.

*Lipase Determinations in Serum of Diabetic Patients. F. Göbel.—p. 1698.

Lipase Determinations in Serum of Diabetic Patients.—Göbel determined the lipase content of serum of twenty-one diabetic patients. Determinations were made before and after insulin and dietetic therapy, in a control case before and after dietetic treatment. Measuring of the lipase content was made with a stalagmometer according to Rona-Michaelis. Before treatment, increased lipase was found in the serum along with increased blood and urine sugar values according to the severity of the diabetes. The lipase content decreased following treatment along with the blood and urine sugar values. On the basis of these results the author assumes a disturbance in the fermenting processes of fat metabolism in diabetes mellitus proportional to the rate of sugar secretion and outpouring of lipase into the serum.

87: 29-56 (Jan. 12) 1940

*Progesterone Therapy in Habitual and Threatened Abortion. K. Frohnwieser.—p. 29.

Meningococcus Carriers. K. Luz.—p. 30.

Operative Measures for Protection of Eye in Bell's Paralysis. K. Oberhoff.—p. 33.

Divergent Alkali Tolerance of Ulcerous Patients. F. Klewitz and H.-W. Schmidt.—p. 34.

Place of Anesthesia Therapy in Pathology and Therapeutics. K. R. von Roques.—p. 34.

Progesterone Therapy in Habitual and Threatened Abortion.—Frohnwieser reports the successful management with progesterone of eight cases of pregnancy selected from a larger number in which a history of repeated spontaneous miscarriages existed (one totaling eight within six years). In three of the cases glandular therapy was applied to prevent imminent abortion as evidenced by premature bleeding and abdominal pains. The age of the patients was between 21 and 37. Either normal birth and a normal postpartum history could be reported or a normal pregnancy in the ninth month that made further medication unnecessary. Treatment consisted in the administration of 5 international units of progesterone in the form of a corpus luteum preparation given once or twice a week until the thirtieth week of pregnancy. In the author's experience progesterone therapy was successful only in genuine cases of habitual and threatened abortion and invariably unsuccessful when the clinical picture indicated an incipient or progressive stage of the condition. Patients under observation are counseled to report at once after pregnancy is diagnosed and are treated with semi-weekly doses of 5 international units of the corpus luteum preparation. As pregnancy advances, one tablet of the corpus luteum preparation C is given thrice daily in addition to the 5 or 10 international units. Special attention is paid to gestation periods in which abortive crises had been previously observed. In threatened abortion from 5 to 10 international units is given every other day, and one tablet of corpus luteum preparation C is added three times a day. Progesterone therapy is discontinued eight weeks before expected confinement. On no occasion has the author encountered antepartum or postpartum complication to prolonged medication.

Wiener klinische Wochenschrift, Vienna

53: 1-24 (Jan. 5) 1940. Partial Index

Diet and Diseases of Blood. N. von Jagié.—p. 1.

Allergic Diseases of Skin, with Special Consideration of Occupational Dermatoses. K. Schreiner.—p. 3.

*Diluted Hydrochloric Acid in Treatment of Tonsillitis. N. Guntzscheff.—p. 11.

Diluted Hydrochloric Acid in Tonsillitis.—By observations on himself extending over a period of eight years, Guntzscheff concluded that diluted hydrochloric acid (12.5 per cent) is effective in the treatment of tonsillitis. He employs hydrochloric acid for gargling and drinking as well as for the irrigation of the tonsils. The method applied in twenty-three unselected cases demonstrated its efficiency in the treatment of acute tonsillitis and suggested its further use as a prophylactic measure. The method has been found helpful in diphtheria. The author recommends from eight to twenty drops of diluted hydro-

chloric acid in 200 cc. of lukewarm water for gargling and from twenty-five to thirty drops in from one half to one glass of water for irrigation. The gargling should be repeated every thirty minutes, for about one minute each time. The drinking (about a teaspoonful) is repeated every thirty minutes. The irrigation of the tonsils is accomplished by immersing a cotton compress (size of a nut) into the glass containing the mixture and then pressing it against the upper pole of the tonsil. The author states that the treatment described effects a rapid cure, that it is harmless and inexpensive, and that it can be employed for patients of all ages.

Nordisk Medicin, Helsingfors

4: 3637-3692 (Dec. 16) 1939. Partial Index

Hospitalstidende

*Treatment of Sequelae of Concussion of Brain and Some Other Cerebral Conditions with Subarachnoid Insufflation of Air (Pneumocephalon Artificiale). K. Roepstorff.—p. 3637.

Determination of Ascorbic Acid in Serum and in Daily Diet in Seventy Nurses Given Stomatologic Examination. M. Ottsen, H. Lieck and O. Brinch.—p. 3650.

Treatment of Cerebral Conditions with Insufflation of Air (Pneumocephalon Artificiale).—Roepstorff says that air insufflation treatment is contraindicated in cases with increased brain pressure and changes in the eyegrounds and especially when tumor in the posterior lobe is suspected. The treatment must not be undertaken without careful neurologic examination, including ophthalmoscopy. The contraindications for ordinary smaller interventions must also be observed. With these precautions the treatment is believed to be without danger. Forty-three cases of concussion of the brain with sequels are described in which subarachnoid insufflation of air was followed by good results in about 70 per cent, temporary improvement in about 19 per cent and no effect in about 12 per cent. Other cases treated by the method are also reported. Of sixteen cases of cryptogenic headache ten were improved, five temporarily improved and one slightly improved. In four cases of otogenic or cerebral, nontraumatic vertigo, the dizziness disappeared without other noticeable improvement in the condition. In four cases of narcolepsy the attacks disappeared for a longer or shorter time, and in three cases of epilepsy there was temporary disappearance of the symptoms, while in one case of traumatic epilepsy there have been no attacks for three years. In a case of status epilepticus the attacks ceased, to return gradually after a couple of weeks.

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Sterility in Woman. N. Blixenkron-Møller.—p. 3797.

*Electrocardiogram During Insulin Shock Treatment. A. Grut and M. Lund.—p. 3805.

Epidemiology of Herpes Zoster. L. C. Stage.—p. 3808.

Investigations on Relation of Serum Calcium in Different Neurologic and Medical Diseases: I. Observations on Serum Calcium under Normal Conditions. O. J. Nielsen.—p. 3811.

Id.: II. Determination of Serum Calcium. W. Hjarde and O. J. Nielsen.—p. 3812.

Effect of Epileptic Attacks Due to Metrazol on Lactic Acid Content of Blood. P. Horstmann.—p. 3815.

Electrocardiogram During Insulin Shock Treatment.—Grut and Lund made electrocardiographic recordings (1) during insulin shock, (2) on simultaneous administration of insulin and dextrose and (3) after interruption of insulin shock with dextrose. They assert that sinus arrhythmia, found only in group 1, is the only electrocardiographic change directly due to the hypoglycemia. A slight, never pathologic, broadening of QRS and QT and a narrowing of PQ appear in groups 1 and 3; possibly the hypoglycemia is a contributing factor in these changes. The T depression, most marked in groups 1 and 2, is regarded as an insulin effect; the tachycardia, which is relatively frequent in group 3, and the U wave, in groups 2 and 3, are seen as secondary effects of the insulin (epinephrine and so on). Registration of heart sounds and electrocardiograms show a shortening of the mechanical systole, as found by Hegglin. Because (1) this shortening continues after the hypoglycemic stage, (2) corresponding changes are seen after epinephrine and (3) hyperadrenalemia is often observed after insulin the authors ascribe the shortening of the mechanical systole to a rise of pressure in the aorta resulting from the production of epinephrine secondary to the insulin effect.

